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S. Hemphill

C. Plott

G. Stern

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SOUTHERN CALIFORNIA
EDISON

An EDISON INTERNATIONAL Company

Rebuttal Testimony

Before the

California Energy Commission

Rosemead, California

August 12, 2005

Southern California Edison Company's Rebuttal Testimony

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I.

**THE ECONOMIC ANALYSIS PRESENTED BY CEC STAFF IS ILLOGICAL,
CONTRADICTIONARY AND RELIES ON INACCURATE ASSUMPTIONS**

A. Introduction

The testimony of Julia Frayer and Michael Jaske is fraught with serious errors of economic analysis. The premise of Julia Frayer's testimony is that the release of additional information by buyers will actually reduce the prices that those buyers will pay. Ms. Frayer outlines her key argument on page 4 of her testimony:

Accordingly, information dissemination, such as that proposed in the NOI, should reduce uncertainties of suppliers and provide for more efficient market outcomes under a competitive market structure, including lower prices as a result of lower embedded risk premiums in the offers of suppliers and aggressive competition among existing supplies, as well as competitive pressures from possible new development.¹

Ms. Frayer also contends, in several places of her testimony, that the public release of buyers' confidential information will not be harmful to buyers because the majority of the information is already in the public domain, and the public release of the data provides merely a refinement of the proxy information currently available to suppliers.

This testimony will demonstrate that: (1) the assumptions underlying the argument that buyers will be helped by the release of their private data are not valid; (2) the conclusion that buyers will be helped and not harmed by the release of their private data, under the circumstances that presently exist in the California electricity market, is wrong; and (3) the argument that no harm will be done by releasing buyers' confidential information because so much information is already publicly available contradicts the argument that releasing the information will improve the market, and demonstrates that Ms. Frayer's testimony is more rhetoric than reason. Ms Frayer's conclusions and recommendations are naïve and should be rejected by the Commission.

¹ CEC/Frayer, p. 4.

1 This chapter also proves false the contention that the California market cannot be
2 plunged into a new "energy crisis." As noted below, many of the conditions present in
3 2000-2001 are still with us.

4 **B. Buyers Will Likely Be Harmed By the Release of Confidential Information**

5 Before addressing the inaccurate assumptions underlying Ms. Frayer's argument
6 that buyers will be helped by public release of their confidential data, I demonstrate that
7 the basic premise is illogical. Ms. Frayer contends that access to information about
8 buyers' needs for additional power will reduce sellers' uncertainty and risk, result in more
9 aggressive competition among sellers, and ultimately lead to lower prices for buyers. More
10 aggressive competition among sellers is just another way of saying that after receiving
11 buyers' confidential information, sellers would offer their power at lower prices, since the
12 risk and uncertainty about certain information underlying their pricing would be reduced
13 or eliminated. It is evident that whether the disclosure of buyers' information about their
14 need for additional power leads sellers to lower their prices depends strongly on the
15 content of that information, and the nature of the market in which the transactions will
16 occur. Consider the following two scenarios.

17 **Scenario 1**

18 There are ten sellers of capacity, each with 100 MW of power to sell. Buyer A issues
19 a Request for Offers (RFO) to acquire an unknown quantity of power. Initially, the sellers
20 have no information about the level of procurement that will take place. The sellers know
21 that Buyer A must acquire sufficient power to meet a regulatory resource adequacy
22 requirement of 115% of A's peak load, but they do not know A's load forecast or the
23 magnitude of A's existing stock of power. This uncertainty causes the sellers to balance
24 uncertainties inherent in future bids, since the sale of power may result in a foregone
25 opportunity of higher value later or may represent an opportunity now for a good price
26 that will not be available later. Now suppose that Buyer A is then required to release its
27 power requirements, and it is revealed that Buyer A needs to procure only 100 MW to

1 fulfill its needs. This information may lead the sellers to conclude that their opportunity
2 to sell to Buyer A in some subsequent RFO, or even to sell to another buyer, competing
3 against essentially the same set of suppliers, is small. The sellers recognize that this
4 auction will be very competitive and a bid strategy that attempts to capture any
5 substantial premium over marginal cost is likely to result in a losing bid. In scenario 1,
6 the release of buyer information may indeed lead to lower prices paid by buyer A.

7 Scenario 2

8 There are two sellers of capacity, each with 500 MW of power to sell. Again, Buyer
9 A issues an RFO, is under a 115% of peak resource adequacy requirement, and the sellers
10 initially do not know the extent of Buyer A's needs. In this scenario, when Buyer A is
11 required to release its power requirements, it is revealed that Buyer A immediately needs
12 to acquire 600 MW. The sellers once again face reduced uncertainty. In fact, they each
13 now know that Buyer A must acquire at least 100 MW of power from each of the sellers in
14 order to satisfy its demand. The price that each seller can demand for the sale of at least
15 the last 100 MW of its available power is constrained only by the penalties Buyer A might
16 face for failing to meet its regulatory requirement, or the consequences of regulatory
17 oversight of the power auction. It is evident that in this scenario the buyer can expect to
18 pay a much higher price once its confidential data is released publicly.

19 The conclusion that one must draw from these scenarios is that one cannot
20 determine the magnitude, or even the direction, of the impact of revealing a buyer's
21 confidential information unless one knows the conditions of the market into which this
22 information is to be revealed. Thus, even if one believes the unsupported statement that
23 buyers will be helped by the release of their confidential data, the statement can only be
24 true under certain assumptions about the market. As discussed later in this testimony,
25 the market conditions in California will most likely result in higher prices for California
26 consumers if the IOU's market sensitive information is revealed, as the CEC staff
27 proposes.

1 C. Ms. Frayer's Analysis Relies On An Assumption That Buyers Do Not Know
2 Their Best Interest in Disclosing Information and, Moreover, That
3 Somehow Her Argument Does Not Apply Symmetrically to Sellers

4 Ms. Frayer asserts that the release by buyers of information about their needs will
5 reduce sellers' uncertainty and thereby encourage more aggressive competition among
6 sellers to the benefit of buyers. Ms. Frayer presents no analysis whatsoever showing that
7 reduced supplier uncertainty will lead to more aggressive competition by sellers. One
8 need not explore the inconsistencies of her argument to understand its implausibility
9 because it is predicated on the fact that buyers do not know what is in their best interest,
10 and must be forced to reveal their confidential information because, though the medicine
11 does not taste good, it will be good for them. Ms. Frayer's theory and its factual predicates
12 are wrong.

13 Ms. Frayer's testimony is also contradicted by the manifest reluctance of power
14 sellers to disclose their own confidential information. In other words, the disclosure Ms.
15 Frayer proposes is only partial (only IOUs, not all buyers disclose) and is one-sided (only
16 buyers disclose, not sellers). Assume that Ms. Frayer is correct in her assertion that the
17 release by buyers of information about their needs would reduce sellers' uncertainty, and
18 encourage more aggressive competition – thus reducing prices ultimately paid by buyers.
19 Then would not the corollary be that sellers should be required to release confidential
20 information, such as the degree to which their output is committed under contract, and
21 their operating cost information, including gas contracts? The public release of this
22 information would surely reduce buyers' uncertainty! By reducing the risks that buyers
23 face, they should be willing to compete more aggressively for supply, thus increasing the
24 price buyers are willing to pay to satisfy their needs. This would certainly be an aid to
25 sellers. However, Ms. Frayer and the CEC staff make no such recommendation. Should
26 sellers be required to have this confidential information publicly released, since it is,
27 under Ms. Frayer's theory, in the sellers' best interest to do so? If power sellers really

1 believed this argument, they would be urging the mandatory release of all confidential
2 seller information! By contrast, if sellers do not believe that they should be required to
3 release their information (because they do not really believe that the reduction in buyers'
4 uncertainty will lead to higher prices), then, it would seem that the sellers themselves are
5 not convinced that Ms. Frayer's theory is correct.

6 **D. Ms. Frayer Is Mistaken in Concluding That the Structure of the California**
7 **Market Will Somehow Prevent Market Manipulation**

8 Ms. Frayer's assumptions about the structure of the power market in which this
9 information would be used are seriously flawed. She asserts that: (1) there are many
10 sellers;² (2) there are no barriers to entry;³ and (3) the large number of markets and the
11 complexity of these markets makes manipulation and market power difficult.⁴ Each of
12 these assumptions is false.

13 Ms. Frayer argues that there are many sellers, which would limit the potential for
14 tacit collusion. In fact, the number of large sellers of capacity is substantially limited.
15 Within California, there are no more than six sellers with large portfolios,⁵ and the
16 amount of capacity available from the remaining small sellers is insufficient to meet the
17 needs of the large load-serving entities (LSEs). This cannot be fairly represented as a
18 market with a large number of sellers. Ms. Frayer naively argues that we need not worry
19 about tacit collusion in this market because the conditions for tacit collusion, as put forth
20 by Jean Tirole, are not met. Ms. Frayer misunderstands Dr. Tirole's analysis. Dr. Tirole's
21 conditions include: (1) market participants are able to see each other's prices, (2) suppliers
22 have similar cost structures, and (3) there is a high concentration of suppliers. While it is

² CEC/Frayer, p. 8.

³ Id., pp. 2-3.

⁴ Id., p. 9.

⁵ The six are: AES (plants controlled by Williams), Calpine, Duke, Dynegy, Mirant, and Reliant.

1 not evident that even the first of these three conditions has been met, there is another
2 condition facilitating the potential for tacit collusion that Dr. Tirole would not have even
3 bothered to consider, as it is not consistent with typical markets, but is, unfortunately, a
4 defining characteristic of electricity markets: a vertical or at least nearly completely
5 inelastic demand curve. This factor is critical since it greatly enhances the potential gains
6 from tacit collusion, thus substantially broadening the conditions under which one might
7 observe it. As noted above, there is a high concentration of suppliers, and although Ms.
8 Frayer has failed to note this fact, each of these suppliers that owns well over 2,000 MW of
9 existing supply in California, is almost exclusively fueled by natural gas, with facilities
10 whose heat rates are similar, resulting in Dr. Tirole's "similar cost structure" condition
11 being met.

12 One need not be limited by theory in determining that tacit collusion is possible in
13 California's electricity market. There was a substantial history of observed tacit collusion
14 during the California energy crisis of 2000-2001. The bidding behavior of four of the five
15 large generators⁶ during summer 2000 showed remarkable similarity, while at the same
16 time being completely dissociated with underlying costs of production. Ms. Frayer ignores
17 this recent evidence of market manipulation as if it never occurred. The Commission
18 should not be so cavalier. There have been many examinations of this collusive behavior
19 in California energy markets that conclude that market power was being exercised by this
20 set of sellers (Borenstein, Bushnell and Wolak's paper and Joskow and Khan's paper to
21 name just two). In addition, the evidence of tacit collusion is demonstrated by the actual
22 bidding behavior of these market participants as documented in the work by Caroline
23 Berry. The facts show that not only is tacit collusion and market power possible in

⁶ Calpine did not have a substantial portfolio at that time, and Duke had sufficiently sold its power forward during summer of 2000, that its bidding behavior did not match the others until late 2000/early 2001.

1 California's electricity market, but it has been experienced to a tremendous degree costing
2 California consumers many billions of dollars in unwarranted costs. For Ms. Frayer to
3 argue that we need not concern ourselves about the possibility of market power in light of
4 the \$40+ billion that California has already lost to market power is the height of naiveté.
5 It would in my opinion be irresponsible for California regulators to adopt her
6 recommendations in light of the recent and extreme evidence of market manipulation in
7 California.

8 Ms. Frayer also claims that "to the extent that there are no barriers to entry, new
9 supply will discipline manipulation that the IOUs so strongly fear."¹ Ms. Frayer bases her
10 contention that there are no barriers to entry on the simple assertion that there is a
11 "potential for many new suppliers." Although it may be true that *in the long run*, new
12 generation can be built, her broad conclusion that therefore there are no barriers to entry
13 is simply not consistent with the long lead time, difficult siting, and substantial capital
14 investment associated with new power plant development in California. The long lead
15 times and other challenges associated with building new generation are essentially the
16 same today as they were during the 2000-2001 crisis. While these barriers are by no
17 means insurmountable given sufficient time and resources, their continual existence
18 clearly creates the opportunity for incumbents to exert large amounts of market power for
19 extended periods of time. During the 2000-2001 energy crisis, California experienced such
20 high prices from market power and market manipulation that the losses to the state were
21 estimated to have been up to \$40 billion. It is no wonder that California's IOUs (one of
22 which was driven into bankruptcy, another to the brink of bankruptcy) strongly fear such
23 manipulation on behalf of their customers. Moreover, it is noteworthy that new entry did
24 not prevent the manipulation or "discipline" the market during that crisis. Either there

¹ CEC/Frayer, p. 29.

1 are in fact substantial barriers to entry, or the assertion that new entry will protect
2 against this manipulation is untrue. In either event, Ms. Frayer's assertions are highly
3 suspect in light of what has occurred in California in the recent past. It is telling,
4 however, to note that Ms. Frayer utterly fails to address any of this evidence market
5 manipulation in her testimony.

6 If a problem, such as market power, does exist in the electricity markets, resulting
7 in high prices, then even if these high prices provided an incentive for new generation
8 investment, it would likely take 3-4 years before the new generation could come on line.
9 The cost consequences of waiting for the price signal to result in such a response could be
10 astronomical. Ms. Frayer again ignores these real world considerations. Moreover, since
11 new entry would lower the price, suppliers will not build expecting to receive the prices in
12 the current market, but those that they forecast will exist after their new plant is built.
13 Finally, the new generation investment market is such that new entry simply is not
14 happening based on sellers' observing market price signals. New generation investment
15 occurs from long-term contracts being offered by a creditworthy load-serving entity (LSE).
16 Ms. Frayer's arguments about the release of confidential buyer information providing
17 important price signals for new investment is just not supported by the facts. The new
18 investment signal that builders of new generation respond to is a contract with a
19 creditworthy LSE, period.

20 Finally, Ms. Frayer's third assertion about the structure of the market is that
21 gaming and manipulation is unlikely because of the large number of markets and the
22 market complexity. Nothing could be further from the truth. California's electricity
23 market is indeed properly characterized as containing many markets and being highly
24 complex. It may also be the most manipulated and gamed market in history, precisely
25 because of its complexity and the interactions between the many markets. The testimony
26 of Peter Fox-Penner for the California Parties in the FERC refund proceeding from March
27 2003 (FERC Docket EL-095), describes the myriad games and manipulative strategies

1 that were identified and quantified within just the 100 days allowed the California Parties
2 by FERC to conduct discovery and analysis of the California market at that time. Later,
3 Dr. Fox-Penner created a "calendar" for the summer of 2000 showing that the number of
4 tariff-violating manipulative strategies employed by the various market participants in
5 each and every hour of the summer typically exceeded 30. In other words, in almost every
6 single hour of the entire summer of 2000, there was evidence of at least 30 gaming
7 strategies being employed by market participants. These primarily consisted of the so-
8 called Enron games with names such as Fat Boy, Ricochet, Death Star, and Get Shorty.
9 As Dr. Fox-Penner's testimony describes, these games were possible precisely because of
10 the complexity of the many markets, and the resulting inability to effectively monitor the
11 activities in all these complex markets. Again, Ms. Frayer simply ignores these real world
12 conditions and effectively assumes them away in her analysis.

13 Ms. Frayer draws a wholly inaccurate conclusion about the California markets and
14 their vulnerability to market power and manipulation, despite the extensive recent history
15 of just that. Based on her naïve assumptions and faulty conclusions, she argues that the
16 California markets must be assumed to be competitive ("the exiting market structures
17 would suggest that workable competition is the norm," p. 4), and therefore buyers will be
18 helped by forced release of their confidential information. This argument can reasonably
19 be described as a house of cards whose underpinnings have been knocked out. It is also
20 extremely naïve and irresponsible for her to make her recommendations without
21 addressing the overwhelming evidence from the recent past in California.

22 The previous arguments show that Ms. Frayer's rests her basic assertion that
23 public release of buyer information will reduce costs to buyers on the fundamental
24 underlying assumption that California's electricity markets are structured in such a way
25 as to make manipulation impossible or very unlikely, but this assumption has been
26 demonstrated to be false in the recent past. In particular, the market for which SCE is
27 seeking to maintain buyer data confidentiality is, at the very least, the market for capacity

1 where buyers are faced with a resource adequacy requirement (RAR). SCE has very good
2 reason to believe that this market will not behave competitively. The requirement that
3 LSEs meet 115% of their peak load with capacity procurement essentially guarantees both
4 an inelastic, if not vertical, demand curve, and a market in which the total available
5 supply is not expected to exceed the required demand by much, increasing the likelihood of
6 collusion (tacit or otherwise) or even individual market power by a pivotal supplier.
7 Furthermore, to the extent the current requirement can only really be met through
8 bilateral capacity contracts, there may effectively be no market power mitigation to
9 protect buyers (with the possible exception being a complaint to the CPUC that may result
10 in the granting of a waiver for some portion of the RAR). Under these conditions, which
11 strongly favor the seller in an auction or negotiation setting, the asymmetric release of
12 information advocated by Ms. Frayer (buyer information becoming available to sellers
13 without equivalent seller information becoming available to buyers) is a recipe for
14 disaster.

15 Ms. Frayer's arguments are blind to the possibility of buyer harm, despite the fact
16 that the release of this information is being sought at the request of the very sellers that
17 Ms. Frayer argues would be harmed and against the wishes of the buyers that would
18 presumably benefit from the public release of their data. And her arguments are based
19 solely on the naïve acceptance of theory, using unfounded and questionable (at best)
20 assumptions, in contradiction to valid experimental analysis, common sense, the
21 demonstrated self interest of all the parties, and the recent history of California electricity
22 market performance.

23 **E. Ms. Frayer's Arguments Are Undercut By The Claim That The Data Is Not**
24 **New**

25 Perhaps even more questionable than Ms. Frayer's theory that buyers will be
26 helped by the forced public release of their confidential data, is the assertion that buyers
27 will not be harmed because essentially all the data is already public. Ms. Frayer

1 discusses, at some length, the asserted fact that the data that buyers seeks to protect:
2 (1) will only be made available in aggregate form, and (2) is not substantially different
3 than the public data that already exists.⁸ As such, she argues that the buyers' concerns
4 regarding the harm from the release of this information are unfounded, as proxies for this
5 information already exist in the public domain. The gist of this argument, clearly a "heads
6 I win, tails you lose" argument, is that buyers should not be concerned about the harm
7 that could be caused by sellers' access to buyers' confidential information because that
8 information is essentially (proxy, approximate, substitute, etc.) already in the public
9 domain, but, buyers will gain because this information will make sellers compete more
10 aggressively and lower their costs. Ms. Frayer states in her testimony on p 19-20:

11 First the NOI is proposing the release of aggregated, non-resource specific data,
12 which would make it difficult for suppliers to identify the exact commitments of
13 their competitors. Second, the first three years of the forecast time horizon
14 (2006-2008) from the resource plans will not be released.

15 Either the confidential information is of value, and will have an impact on markets
16 (one way or the other) because it is new or different than the current publicly-available set
17 of information, or there is neither any real harm to be suffered by buyers, nor gain to be
18 had by sellers, from the public release of the data since it really is not new or different
19 from other publicly available data. Ms. Frayer wants it both ways. She would have the
20 Commission on the one hand believe that there is no need to protect this data because it is
21 not really new. On the other hand, she asserts that its value is so great that buyers
22 should be forced to reveal it over their strenuous objections because they just do not
23 understand that its release will be good for them. These transparent arguments to
24 support a "seller's perspective" position on the asymmetric release of information should
25 be disregarded, and customers should be protected by having the buyers' data remain
26 confidential.

⁸ CEC/Frayer, pp. 11 - 13.

1 Not only is Ms. Frayer's reasoning flawed, but her "Winner's Curse" argument² is
2 also misplaced. Ms. Frayer argues that if suppliers have incorrect information in an
3 auction, a supplier who wins the supply contract ultimately loses money because his
4 winning bid was based on incorrect internal estimates. The supplier thus suffers a
5 "winner's curse." This argument has several defects. First, irrespective of the information
6 released by buyers, a seller knows its costs of selling a specified product. Information
7 released beyond the product specification does not impact a seller's "internal estimates"
8 related to the cost of providing that product. Second, one must ask what it means for a
9 supplier to lose money as a result of winning in the auction. Clearly this means that the
10 supplier sold his power for less than he otherwise would have, had he possessed a better or
11 more accurate "estimate." Therefore, in this scenario, the buyer did not have to disclose
12 its confidential data, and as a result the seller bid and was awarded the bid at a lower
13 price than if the information had been disclosed. Of course, if the seller obtained a lower
14 price in a situation where data was protected, the buyer also paid a lower price.

15 Ms. Frayer, in the "Winner's Curse" example, proves the contrary of her prior
16 argument. The "Winner's Curse" example shows that a buyer could in fact be harmed
17 through the disclosure of its confidential information. The curse of the winning supplier
18 (who, if at all competent, will not actually lose money as bidding below operating costs
19 would be foolish, but will simply not profit as much as in the alternative case when buyer's
20 confidential data is made public) is the boon of the buyer.

21 **F. Ms. Frayer's Arguments Are Contradictory**

22 **How does Ms. Frayer reconcile the following three statements?**

23 "In my professional opinion, the aggregated summary tables are not a 'trade secret'
24 because their release will benefit ratepayers." (p. 5)

² Id., p. 16.

1 "One key way that revelation of information reduces risk is by decreasing the
2 chance that a winning bidder will suffer the 'Winner's Curse', where the supplier wins the
3 supply contract, but ultimately loses money because his winning bid was based on
4 incorrect internal estimates (incorrect private information)." (p. 16)

5 "The aggregated summary tables proposed to be released by the NOI cannot be
6 reasonably deemed as a 'trade secret' as similar commercial information is already in the
7 public domain." (p. 11)

8 If one reads these statements together, it appears that ratepayers benefit from the
9 release of their information, information that is similar to commercial information already
10 in the public domain, because otherwise sellers would submit bids that were too low,
11 causing the sellers to lose money.

12 Ms. Frayer fails to grasp the importance of the asymmetry of the proposed release
13 of information. Under the CEC staff proposal, buyers will disclose confidential data;
14 sellers will not. In her testimony, Ms. Frayer describes the economic theory associated
15 with the benefits of information availability to an efficient auction.¹⁰ In particular, she
16 states, "dissemination of information that helps refine the participants' views on the value
17 of the product being **sold/bought** is generally considered efficiency enhancing."¹¹ But Ms.
18 Frayer's theory is, as stated, being equally and symmetrically applied to the buyers and
19 sellers. The CEC staff proposal to publicly release confidential information applies only to
20 buyers. In other words, Ms. Frayer's conclusions do not apply to the one-sided release of
21 information that the Commission staff proposes and Ms. Frayer supports. There are no
22 recommendations being made in this or any other forum that would require the equal and
23 complete disclosure of information from all market participants, nor is there any practical
24 way in which to enforce a requirement for equal and full disclosure.

¹⁰ CEC/Frayer, p. 14.

¹¹ Id.; emphasis supplied.

1 Ms. Frayer goes on to discuss the importance of allocating transactions to the lowest
2 cost suppliers, even though cost information from suppliers is maintained as confidential
3 information. Ms. Frayer discusses attaining equilibrium between buyers and sellers, but
4 fails to analyze the fact of asymmetric release of information between buyers and sellers.
5 She goes on to note that Milgrom and Weber “determine that having private information
6 allows a company to make excess profits – a form of market inefficiency.”¹² Yet sellers are
7 explicitly allowed to maintain the confidentiality of their positions in the market, their
8 cost structure, etc., which according to Ms. Frayer’s interpretation of Milgrom and Weber,
9 would permit them to earn excess profits, at customers’ expense. Meanwhile she is
10 recommending that buyers (LSEs such as SCE acting on behalf of their customers, and not
11 earning a red cent in profit from procurement activities) be required to reveal their
12 information, even though, if they also had access to “excess profits” from retaining
13 confidentiality, those profits would take the form of reduced customer costs.

14 When Ms. Frayer explicitly addresses asymmetry¹³ she gets the facts and the
15 definition wrong. First, she asserts incorrectly that “the IOUs are well informed about
16 each other’s positions and have extensive data on suppliers through the various filings
17 prepared by those suppliers to the state and federal regulators.” This is patently false.
18 IOUs are not well informed about each other’s positions, as the only information they have
19 about each other’s positions is that which is publicly available. If the publicly-available
20 information were sufficient to become well-informed about the other IOUs’ positions, then
21 we would not be having this debate about keeping market-sensitive information
22 confidential. Next, she asserts that IOUs have extensive information on suppliers. This is
23 again not true. Suppliers are not regulated in the same sense as IOUs and there is much
24 less information available about suppliers than IOUs in the public domain. Finally, Ms.

¹² CEC/Frayer, p. 15.

¹³ *Id.*, p. 19.

1 Frayer's parenthetical regarding public release of aggregated summary tables, "(which
2 would be disseminated to all and thus preclude the asymmetry between buyers assumed
3 in the experimental study)" demonstrates a fundamental lack of understanding of the
4 asymmetry described in the study. The relevant asymmetry is not an asymmetry of access
5 to the buyers' confidential information, but the fact that buyer information is proposed to
6 be made available to all participants (buyers and sellers) while seller's information would
7 remain confidential. Absent an understanding of this basic definition of asymmetry, Ms.
8 Frayer's conclusions regarding information release, asymmetry, and the impact of the
9 release of buyer's information to the market must be rejected.

10 **G. In Summary, Ms. Frayer's Analysis Is False**

11 In conclusion, Ms. Frayer's testimony naively asserts, based on incorrect
12 assumptions, that buyers will benefit in the form of lower prices if their confidential
13 information is publicly released. She bases this conclusion on faulty logic, without any
14 analysis based on facts, empirical evidence or experimentation, and by using internally
15 inconsistent and contradictory arguments. As such, her testimony cannot form the basis
16 for any conclusions about the benefits to customers from public release of their
17 confidential data. In fact, the only real study and analysis shows that customers would be
18 harmed if their data were asymmetrically released to the sellers. Indeed, California
19 consumers have already been harmed by the manipulative practices of sellers and the
20 unilateral and one-sided release of information would further tilt the playing field against
21 the interests of the IOU's customers.

22 If nothing else, one must step back from the rhetoric and analysis and answer the
23 simple question: If a buyer's information is involuntarily released to the sellers in
24 advance of an auction of solicitation, will the buyer benefit or the seller? Ms. Frayer
25 asserts it will be the buyer. Common sense, economic theory and rigorous
26 experimentation say it will be the seller. If Ms. Frayer believes her own arguments, then
27 she should attempt to put them to use in Las Vegas. She could join a poker game at any

1 casino, and play with her hand exposed to all the other players. They would be able to
2 modify their otherwise inaccurate assessments about what hand she held, and reduce
3 their uncertainty. They would then be able to bid more aggressively, thereby assuring,
4 under her misguided theories, that she would achieve greater success. I will volunteer to
5 participate in an experiment to test this theory, but only as one of the other players. No
6 one in their right mind would bankroll Ms. Frayer. The Commission should similarly
7 reject her recommendations.

8 **H. The Release Of Crucial Demand/Supply Data Could Result In Conditions**
9 **Similar To Those California Witnessed In The 2000-2001 Energy Crisis**

10 Dr. Jaske claims that release of aggregated summary information proposed by the
11 Energy Commission would not contribute to a situation similar to the 2000-2001 energy
12 crisis.¹⁴ Dr. Jaske contends that: (1) the present market situation is different than it was
13 in 2000-2001 because the IOUs in 2000-2001 were required to purchase from a central
14 power market that operated a Day-Ahead hourly energy market, while in 2005 there is no
15 organized Day-Ahead energy market and the spot purchase of IOUs' capacity is no more
16 than 5%; and (2) the IOUs did not provide any forward supply/demand balance
17 information to other market participants in 2000-2001. While Dr. Jaske's statements
18 regarding the differences between the situation in 2000-2001 and 2005 are generally
19 correct, at least for the period in 2000 - 2001 when SCE was procuring power from the ISO
20 and PX, he fails to address the similarities between then and now. Moreover, the
21 differences he cites do not support his conclusion. Rather, they support SCE's position
22 that releasing market sensitive information to market participants could lead to
23 comparable consequences.

¹⁴ CEC/Jaske, p. 7.

1 The crisis in 2000-2001 showed that the existence of a large number of market
2 participants did not prevent those participants from manipulating prices and supply.
3 Increasing the number of market participants did not result in lower prices but in the
4 opposite. Market participants abused their general knowledge of IOUs' need for resources
5 and individually reduced supply and/or increased bid prices to increase clearing prices,
6 rather than trying to maximize their potential sales by lowering their prices below their
7 competitors'. The supplier situation in 2000-2001 is comparable to the one in 2005. There
8 were at least as many market participants in the market in 2000-2001 willing to sell to
9 the IOUs as now, even if the IOUs now contract primarily through competitive
10 solicitations and bilateral contracts.

11 Manipulative business strategies, combined with the frozen retail rates for the
12 IOUs, resulted in the bankruptcy of one IOU and the near-bankruptcy of another.
13 Electricity prices for California's consumers increased dramatically. The arguments of Dr.
14 Jaske do not support why revealing market sensitive information to market participants
15 this time would not result in the same consequences.

16 Another similarity to 2001 is a nearly vertical demand curve. As noted, during the
17 energy crisis SCE faced a set of suppliers who learned that they could profit from their
18 manipulative behavior, and SCE's nearly vertical demand requirements (for energy)
19 ultimately left SCE no choice but to buy at whatever prices the markets permitted. Today,
20 SCE's need is primarily for capacity (as Dr. Jaske notes, we have hedging authority for
21 energy and have used it), and nothing has changed to ensure that California's IOUs are
22 not as short in capacity as they were in energy during the crisis. The demand curve to
23 meet a regulatory capacity requirement is vertical, and there is little or no excess supply.
24 These conditions, too, show more similarity than difference to the 2000-2001 energy crisis.
25 Thus, IOUs could be faced with similar consequences.

II.

CEC'S ATTACK ON DR. PLOTT'S STUDIES IS MISINFORMED AND UNAVAILING

A. Introduction

CEC staff raises three central issues regarding the conditions under which my testimony is reliable. Staff claims that my results do not generalize to specific market forms often used in the procurement of power, and contends that the results of my testimony do not hold if: (i) an auction mechanism is used;¹⁵ (ii) there is no conspiracy, exercise of market power or collusion;¹⁶ and (iii) the information disclosed is only the RNS, as opposed to more information about the demand for electric power.¹⁷

I completely disagree with the CEC's witnesses. Their analysis is deficient in many key respects and their conclusions and recommendations are dangerously naïve, in my opinion. In response to the analysis of the expert witnesses testifying on behalf of the

¹⁵ "First, the claims made by the IOUs and their market experts are based on abstracted experimental analysis which ignores key considerations of the actual procurement process of the IOUs and the current market environment for electricity supply" CEC/Frayer p. 2 (emphasis added). "Thus, through the competitive nature of the selection process, the procurement processes of the IOUs are generally characteristic of an auction." CEC/Frayer p. 13.

¹⁶ "Given the current market structure in the state, with many qualified suppliers and the potential for many new suppliers in the long term, economic theory would suggest that coordinated action (even tacit collusion) is unlikely. Rather, economic theory in conjunction with the existing market structures would suggest that workable competition is the norm." CEC/Frayer pp. 3-4. "IOU's concerns about market manipulation effectively treat the many current electricity suppliers as if they were as a single entity or as if they behaved in a coordinated fashion. This supposes some sort of coordination or tacit collusion in the procurement process. Professor Plott frankly acknowledges his objective in analyzing the 'incentives among competitors that also foretell upward pressure on prices'." CEC/Frayer pp. 21-22.

¹⁷ "Professor Plott tests the impact of continuously revealing the entire demand curve (which consists of quantities for the hypothetical product that the buyer is seeking to procure *and* the marginal value that the buyer places on each incremental quantity) in his experiments." CEC/Frayer p. 2. "The aggregated summary tables will show total demand and total resources; the NOI does not propose to reveal the IOU's marginal value of energy supply, which is exactly what the experimental study assessed." CEC/Frayer p. 21. "This is a severe abstraction of the reality of the NOI proposal. The aggregated summary tables as proposed in the NOI would be equivalent to a single quantity point in contrast to the entire set of price and quantity pairs for each buyer that the experiment releases to suppliers." CEC/Frayer, p. 21.

CEC staff, I performed additional studies. These additional studies were designed to illustrate the mechanism through which the forced disclosures will hurt the California electricity-consuming public (thereby proving false the assertion that my analysis lacks such a mechanism),¹⁸ and address other criticisms of my testimony raised by the CEC staff testimony. These additional studies thoroughly and conclusively refute the criticisms the CEC staff has raised.

This testimony demonstrates that the claims made by the CEC staff and its hired consultant are demonstrably false. The studies are also used to illustrate the mistakes on which the testimony offered by the CEC are based and to illustrate that the theories they offer are completely inappropriate for the questions at hand, having been developed for application to economic phenomena unrelated to the issue of forced disclosure. A total of 84 auctions were studied.

The summary of results and conclusions is as follows:

- 1. The Disclosure of Residual Net Short Alone Is Sufficient to Drive Up Prices Paid by Electricity Buyers, Without Collusion, Market Power, or Conspiracy**
- 2. Disclosure of A Large Residual Net Short Position Has an Exponentially Higher Impact on Prices than Disclosure of Smaller Residual Net Short Position**
- 3. The Economic Theories Cited by Ms. Frayer Do Not Support the Forced Disclosure of Residual Net Short**

The first two items will be discussed in Sections C through E below, related to my new experiments in economics and its underlying theory. The final conclusion will be presented in Section F.

¹⁸ "The declarations provided by the IOUs coyly imply coordinated interaction among suppliers, but do not describe how these interactions are realized or how current structural elements in California support these implications." CEC/Frayer, p. 3.

1 **B. The Nature of Dr. Plott's Study**

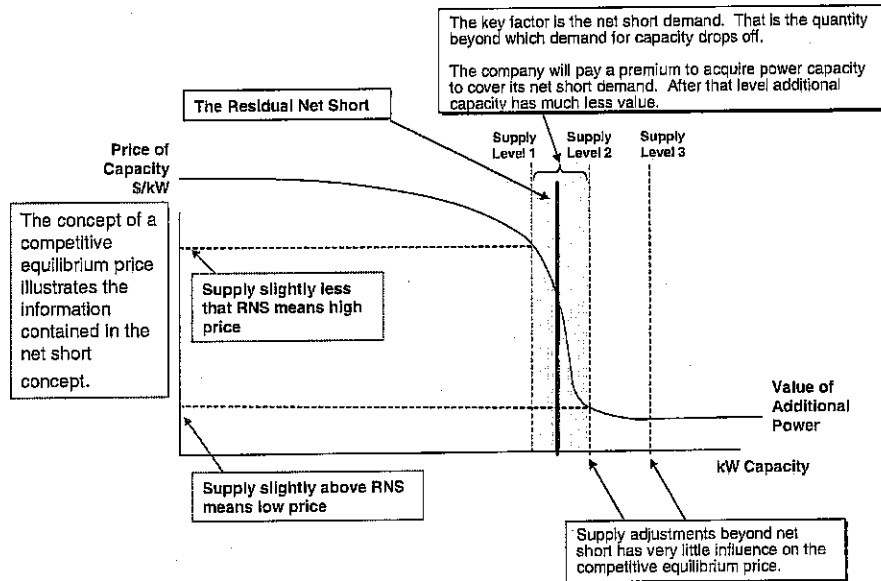
2 I begin with a discussion of the features of the California electricity market about
3 which there is little debate: (i) the demand is relatively inelastic; (ii) increasingly, the
4 market is experiencing limited supplies in which supply capacity is also becoming
5 inelastic;¹⁹ (iii) the implication is that the Residual Net Short (RNS) can be used to
6 measure the gap between needs and availability. These facts are generally accepted by
7 all.

8 Figure 1 illustrates the two concepts at the heart of the discussion, the nature of the
9 (net) demand and the meaning of RNS demand in relation to the (net) demand. The figure
10 represents the net demand for power by the utility company, the quantity beyond the
11 capacity to which it has access or under contract. As can be seen in the figure, demand for
12 electricity is reasonably constant to a point at which it drops off precipitously. This drop-
13 off represents the substantial demand inelasticity that is well known and often discussed
14 related to the electricity industry. It is generally accepted that the maximum price that
15 the market can absorb for a given quantity of electricity consumption is very high up to a
16 critical quantity, where electricity needs are substantially satisfied. Beyond that critical
17 quantity substantial price decreases will not stimulate additional consumption. That is,
18 there is a critical quantity at which electricity consumption becomes insensitive to price.
19 The amount of electricity consumed will be the same regardless of price (unless the price
20 becomes very high). That feature is represented in the curve for (net) electricity demand.

¹⁹ An exception is Frayer, p. 3, who asserts that electricity supply available to California is not subject to capacity limitations due to the ease of entry.

Figure 1

Fig. 1 The Important Features of IOUs' Demand for Capacity



2

The vertical line is the location of the RNS. As can be seen, it is a meaningful concept, because if quantities beyond that level are available, the needs considered most dire by the consuming public will have been met. Greater quantity demanded can only be stimulated by very low prices. Basically, the RNS represents the quantity that the IOU must procure, that is, its demand for electrical power from suppliers. For all practical purposes, the IOU can be forced to pay very high prices to attain that amount. For marginal units beyond that amount, the company would pay very little. Again, these properties of the market and RNS appear to be uncontroversial.

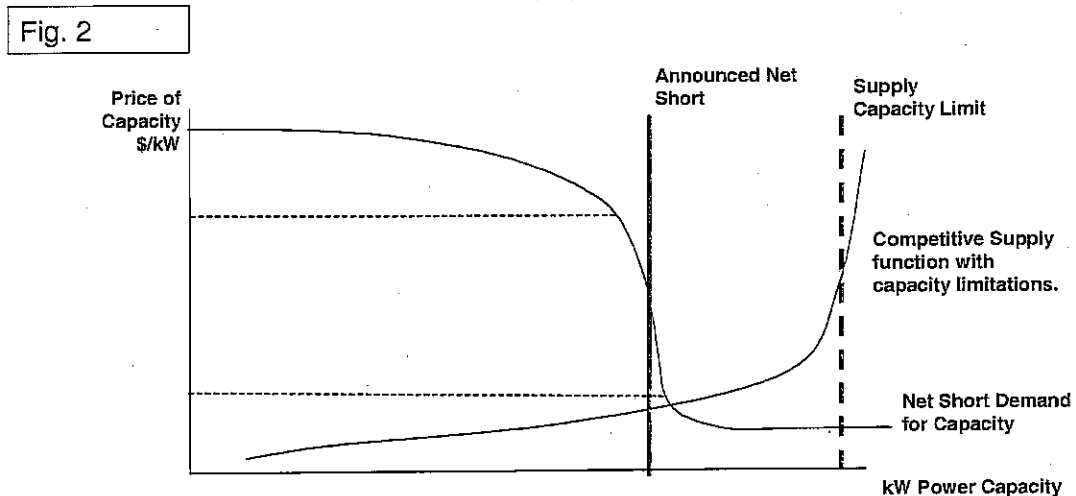
In this study suppliers will know the RNS but will not know the price points associated with the RNS or any other part of the (net) market demand function. Thus we will show that the CEC staff's theory is simply wrong in its claim that knowledge of the

1 marginal willingness of the utility to pay somehow compromised the validity of my
2 previous testimony.²⁰

3 Figure 2 captures an important feature of market supply: the marginal cost of
4 power increases abruptly as capacity limitations are reached. Additional capacity (that is,
5 the marginal unit of supply) is costly to construct (i.e., there are significant barriers to
6 entry) and in some cases it is completely prohibited by policy constraints (such as
7 prohibitions to construct nuclear and/or coal power in the state). The supply function
8 shown in the figure represents the marginal cost, which sharply increases after a limit.
9 The capacity limitations have been studied extensively and their existence and
10 magnitudes are not subject to extensive controversy.

Figure 2

Characteristics of (Net) Demand, Residual Net Short (RNS) and Capacity Limitations on Market Supply



11 From the knowledge of the RNS, together with the capacity limits of the industry,
12 one can deduce the degree to which supply is tight or abundant relative to needs. RNS is

²⁰ See CEC/Frayer, p. 2 and p. 21.

1 the vertical line that represents the amount that the utility must purchase and it
2 identifies the quantity at which the demand becomes highly inelastic. Because it has an
3 obligation to meet its customer's demands, the utility must pay what it takes to acquire
4 power capacity up to that quantity. The utility is thus willing (even required by its
5 obligation to serve) to pay high prices in order to meet its customer demand. But beyond
6 that point, the utility is willing to pay much less because its customer demand has been
7 satisfied. Thus, supplies beyond the RNS do not command a relatively high price but if
8 supply shrinks to less than the RNS, the price will shoot upward. That is, from knowledge
9 of industry supply limitation together with RNS one can deduce how much supply cutback
10 it would take to force the prices up. The "cutback" required to force prices up equals the
11 RNS minus industry supply limitation is a measure of the cutback it would take to force
12 prices up. The gap suggests whether supply is tight or abundant relative to needs and
13 should suppliers successfully limit supply to close the gap they will be rewarded with
14 higher prices. It is important to note that as the data associated with residual net short
15 revelation become more "refined" the deductions and estimates about the amount of
16 "cutback" it takes to force dramatic price increases become easier to make and from a
17 supplier point of view a consensus about a common goal is more precisely formed. I do not
18 believe there is (or should be) controversy over these fundamental observations of market
19 behavior.

20 There is also substantial agreement²¹ that a key form of market organization (for
21 the purpose of policy analysis) is the auction institution. Thus, we implement an auction
22 market, the market institution that the CEC staff feels is most appropriate for analysis of
23 the wholesale power markets.²² The auction is a "discriminative price" auction for
24 multiple units: sellers offer many bids from which the buyer selects and pays the winners

²¹ See CEC/Frayer, p. 13.

²² Id.

1 the amount of their bid.²³ This type of auction has been studied extensively in the
2 scientific literature and I have contributed to the science.²⁴

3 The auction format is a natural extension of previous reports and testimony that
4 demonstrated the negative impact of disclosure on the electricity prices paid by the
5 consuming public when many buyers and sellers exist and when the markets were more
6 along negotiated lines. Since my report was criticized for not studying auctions, I submit
7 these results now. I note in passing that between this study and the study referenced in
8 the previous testimony, many subtle types of organizations exist as special cases. As a
9 consequence, the major conclusions I offer would be expected to hold for the many
10 institutional variations. In particular, I believe they apply to the market conditions in the
11 California market for electrical power.

12 Suppliers in the auctions have similar costs with asymmetries. According to Ms.
13 Frayer, symmetrical costs are thought to be necessary for collusion and make conspiracy
14 easier according.²⁵ Ms. Frayer also claims that for successful coordination "the market
15 participants must be able to see each other's prices, so as to punish firms that undercut

²³ The auction is sometimes called a first price auction, especially when only one unit is bought or sold, and is to be distinguished from excluded bid, one price, or second price auctions.

²⁴ One of the first demonstrations that the multiple unit auction converged to a Nash equilibrium is contained in D. M. Grether, Charles R. Plott and R. Mark Isaac's The Allocation of Scarce Resources: Experimental Economics and the Problem of Allocating Airport Slots, Boulder, CO: Westview Press, 1989 and extended by Charles R. Plott and Gary J. Miller in "Revenue Generating Properties of Sealed-Bid Auctions: An Experimental Analysis of One-Price and Discriminative Processes," in *Research in Experimental Economics* 3, edited by Vernon L. Smith. Greenwich, Connecticut: JAI Press, 1985. I have made many other contributions to the study of auctions in both applied circumstances and in the context of basic science. See Jacob K. Goeree, Charles R. Plott and John Wooders. "Bidders' Choice Auctions: Raising Revenues Through the Right to Choose," *Journal of the European - Economic Associates*. Forthcoming. See also Charles R. Plott and Timothy C. Salmon "The Simultaneous, Ascending Auction: Dynamics of Price Adjustment in Experiments and in the U.K. 3G Spectrum Auction," *Journal of Economic Behavior and Organization* 53:3 (2004):353-383. Charles R. Plott and Kay-Yut Chen. "Nonlinear Behavior in Sealed Bid First Price Auctions," *Games and Economic Behavior* 25, (1998):34-78.

²⁵ CEC/Frayer p. 22.

1 the other collaborators."²⁶ It is useful to notice that the conditions Ms. Frayer states as
2 necessary for collusion are not present in the auctions I have studied. Moreover, I strongly
3 disagree with Ms. Frayer's conclusion that these attributes are necessary preconditions.
4 In fact, the price increases I have observed as a result of the disclosure of RNS cannot be
5 attributed to collusion or any form of conspiracy. Furthermore, the conditions Ms. Frayer
6 lists as necessary for collusion were not present in the earlier studies that she attempts to
7 criticize. Her theory that the data reported to you resulted from conspiracy or collusion is
8 simply and unequivocally false. While conspiracy and collusion can be real problems, they
9 are not the only mechanism through which the forced disclosure of RNS finds its way to
10 increase prices.

11 The focus of the study is the disclosure of the residual net short position. Basically,
12 this disclosure is an announcement of the quantity that the buyer plans to procure. In my
13 studies, the demand function itself is unknown to the suppliers. It is important to
14 emphasize this particular feature, since the CEC witnesses mistakenly think that an
15 announcement of the demand function, the marginal willingness of the supplier to pay, is
16 in some sense necessary for the disclosure of the RNS to have an adverse effect on prices.
17 I demonstrate in my studies that it is the RNS, and not the demand function itself, that
18 causes the dilatory effects. The results include a demonstration that the theory used by
19 the CEC experts as a tool for analysis is completely inappropriate for the phenomena at
20 issue.

21 Five suppliers are studied in each of the auctions. It is well known in auction
22 theory and in experiments that test such theories that the basic principles operate
23 regardless of the number of bidders. However, it is important to note that the CEC
24 experts erroneously claim that the market consists of dozens of suppliers. In fact, a

²⁶ CEC/Frayer, p. 22.

1 typical procurement auction has only a small handful of suppliers who are qualified and
2 submit realistic bids.

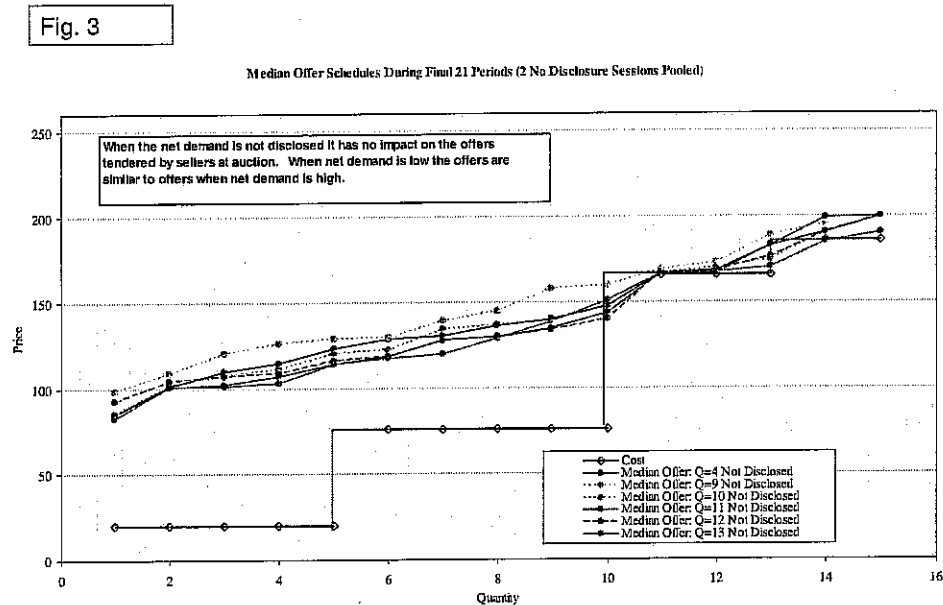
3 C. The Results Of The Study

4 The central result of my study is easy to demonstrate. The disclosure of the RNS
5 influences the bids received by the buyer. When the RNS is high, the bids, and thus the
6 prices paid by the buyer, are high relative to what the buyer would pay in the absence of
7 the disclosure of the RNS. When the RNS is low, the bids and the prices paid by the buyer
8 are low relative to the amount that the buyer would pay in the absence of the disclosure of
9 the RNS. These features remain even if the competitive equilibrium price is unchanged,
10 thereby demonstrating that the price changes result from bids coordinated solely by the
11 public disclosure of the RNS and not the conspiracy theory that forms the substance of the
12 testimony of Ms. Frayer. Contrary to the claims of the CEC staff, the behavior occurs as a
13 natural feature of competition and the way that the public disclosure of RNS coordinates
14 bidding behavior of suppliers and has absolutely nothing to do with collusion or conspiracy
15 in any form. This is not to say that collusion is not a danger – it is. However, the concerns
16 of the IOUs about the impact of the forced disclosures on the prices paid by the consuming
17 public do not rest on a theory of conspiracy or collusion. The potential for higher prices is
18 a direct result of the forced disclosure of the RNS.

19 1. A Baseline

20 First we establish a baseline through the study of what happens when there
21 is no disclosure of the RNS. Shown in Figure 3 are the bids, together with the competitive
22 market supply functions, which reflect the marginal cost of the suppliers.

Figure 3



4

The data shown in the figure are the average of the bids across several experimental sessions, displayed in the form of a supply function that the buyer will face. It is the average of suppliers' bids as faced by the buyer over several auctions. In these auctions the RNS is changed across auctions but the RNS is never announced to the suppliers. That is, the suppliers do not know how much the buyer must procure when tendering bids in these auctions. The figure shows the average bid for each supply level for each of the RNS conditions studied.

As can be seen, the bids reflect a type of "markup" over cost. Furthermore, as one can readily see, the market supply faced by the buyer remains the same in all of the cases of buyer demand; that is, regardless of the absolute level of the RNS. Under the conditions in which the suppliers do not know how much the buyer plans to procure the behavior of the suppliers remains unchanged.

1 **RESULT 1: Bidding by suppliers is similar across all auctions and bidding of**
2 **suppliers is unresponsive to the needs of the buyer. That is, so long as the**
3 **suppliers are unaware of the buyer's residual net short (how much the buyer**
4 **plans to procure), the behavior of the suppliers is the same.**

5 2. The Effects of RNS Disclosure

6 In both theory and reality the situation is dramatically different in auctions
7 where the RNS is announced, as compared to the case when the RNS is not announced.
8 Figure 4 and Figure 5 are theoretical representations of the effects of the announcement
9 on the bidding behavior of suppliers. The case of concern for policy purposes is described
10 in Figure 4. When the RNS is large, suppliers react by increasing bids automatically. It is
11 a natural response to the public information that supplies are limited relative to demand.
12 Figure 5 captures the relationship between the level of the RNS announced and the bids
13 tendered by suppliers. When the RNS is small, the bids tendered by suppliers are smaller.
14 Thus the "revealed supply function," the bids from which the buyer must select the
15 procurement, shifts according to the beliefs of the suppliers about the buying intentions of
16 the buyer. Thus, revelation of the intentions of the supplier has a predictable influence on
17 the options faced.

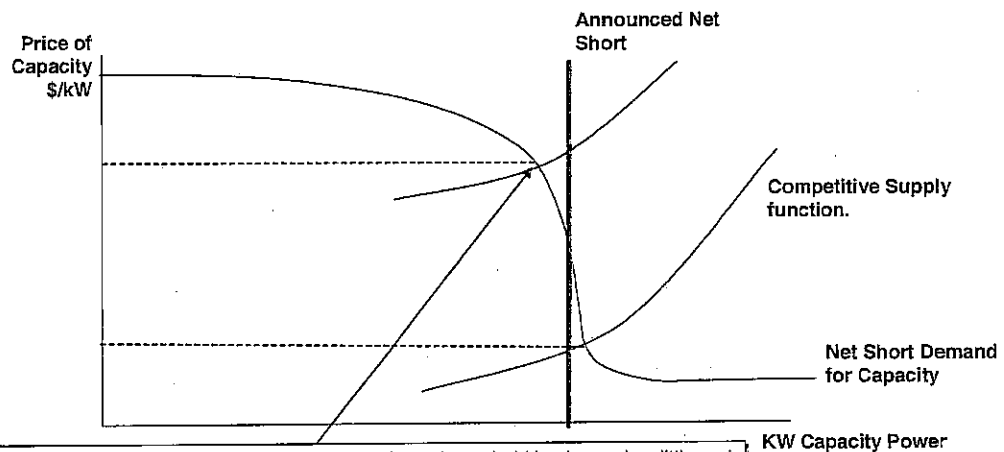
18 The response of supplier bids to the common knowledge of whether supplies
19 are tight or abundant is not difficult to understand and is consistent with many of life's
20 experiences. When a commodity scarcity is anticipated due to poor weather or anticipated
21 bad harvest, the futures prices tend to go up. Anticipated profits of a company are
22 frequently forecast by the behavior of the stock market. With the knowledge of advancing
23 hurricanes, prices for items for which shortages are anticipated begin to rise. When
24 upcoming scarcities are anticipated, the uncoordinated response of a market is for prices
25 to increase reflecting that anticipation. Thus, there should be no surprise by the fact that
26 suppliers will increase their bids in response to a public announcement that supplies are
27 tight. That is exactly what will happen with the forced disclosure of the RNS. When RNS

is large relative to supply, the suppliers can (and will) increase their bids and benefit from the higher prices without danger of loss. The suppliers will benefit but the electricity-consuming public will lose. On the other hand, if the RNS is not announced the suppliers will not increase their bids on the anticipation of a tight market. The failure of the suppliers to gain by capitalizing on the shortage will be the gain to the electricity consuming public of California.

Figure 4

Announcement of Net Short Position and Supplier's Understanding of the General Properties of Market Demand and Supply Coordinates Strategies Among Suppliers to Create Upward Pressures on Prices in the Marketplace

Fig. 4

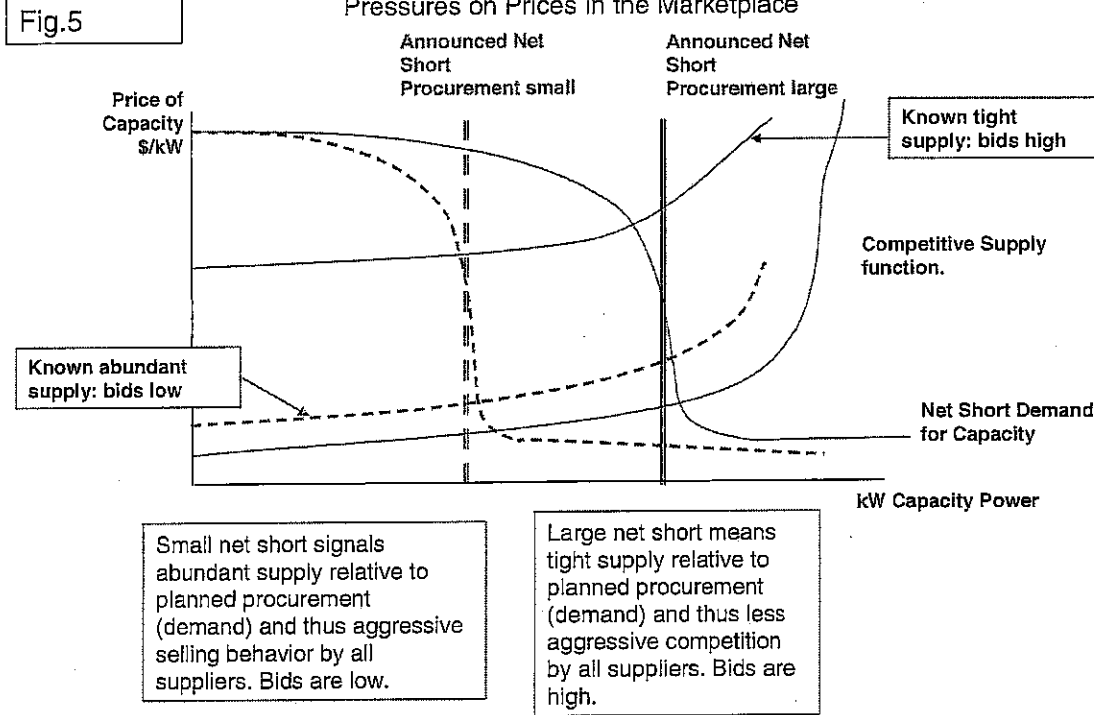


With residual net short announced, each supplier has an incentive to hold back supply a little and this incentive is expressed in the form of increased bids. A common "shortfall" target is created for suppliers and suppliers incorporate this into their bids. The net effect is for suppliers to increase asking prices with the knowledge that others will do the same and that the buyer must buy. This scarce supply relative to demand pushes prices up sharply:

- If supplies are short then the maximum amount that the IOU will pay is known to be high. Prices are kept low by the expectation that competitive suppliers will supply the IOU's needs.
- If such sources of competitive supply are reduced below this target level then all suppliers will benefit from higher prices paid by the IOU.
- That knowledge and coordination creates an incentive for each to hold back a little with the collective result of higher prices.

Figure 5

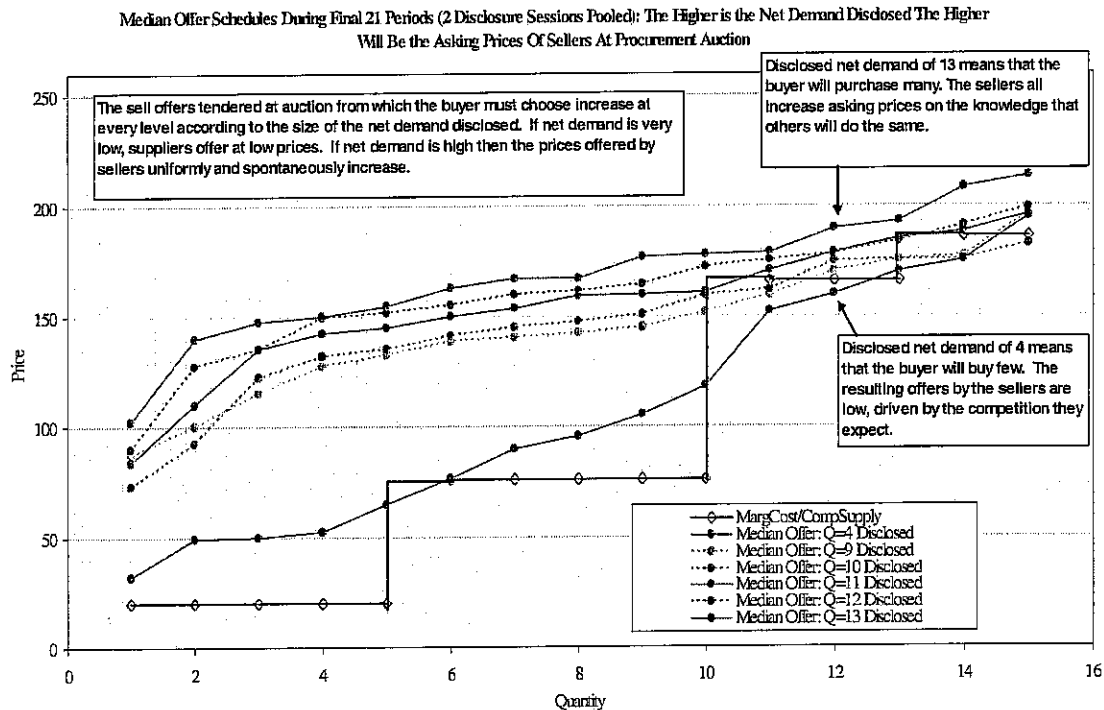
Announcement of Net Short Position and Supplier's Understanding of the General Properties of Market Demand and Supply Coordinates Strategies Among Suppliers to Create Upward Pressures on Prices in the Marketplace



The actual responses of the suppliers for six different levels of RNS disclosure are contained in Figure 6. As can be seen, the bids shift in response to supplier awareness of the conditions of scarcity. It is important to notice that it is the revelation of the RNS alone that signals this important feature of market conditions and coordinates the suppliers. It is not necessary to assume conspiracy or collusion for this to occur.

Figure 6

Fig. 6



RESULT 2. The prices required for procuring supply shift up monotonically as the announced RNS goes up.

Selected parts of the data are displayed again in Figure 7A where both the bids and the disclosed RNS are displayed for four different levels of disclosed RNS (see Figures 7A, 7B, 7C and 7D). Again, it is clear that the impact of revealing the RNS is to influence the bids and that the influence is to increase the bids when the disclosed RNS is increased.

Figure 7A

Fig. 7 A

Median Offer Schedules During Final 21 Periods (2 Disclosure Sessions Pooled): The Higher is the Net Demand Disclosed The Higher Will Be the Asking Prices Of Sellers At Procurement Auction

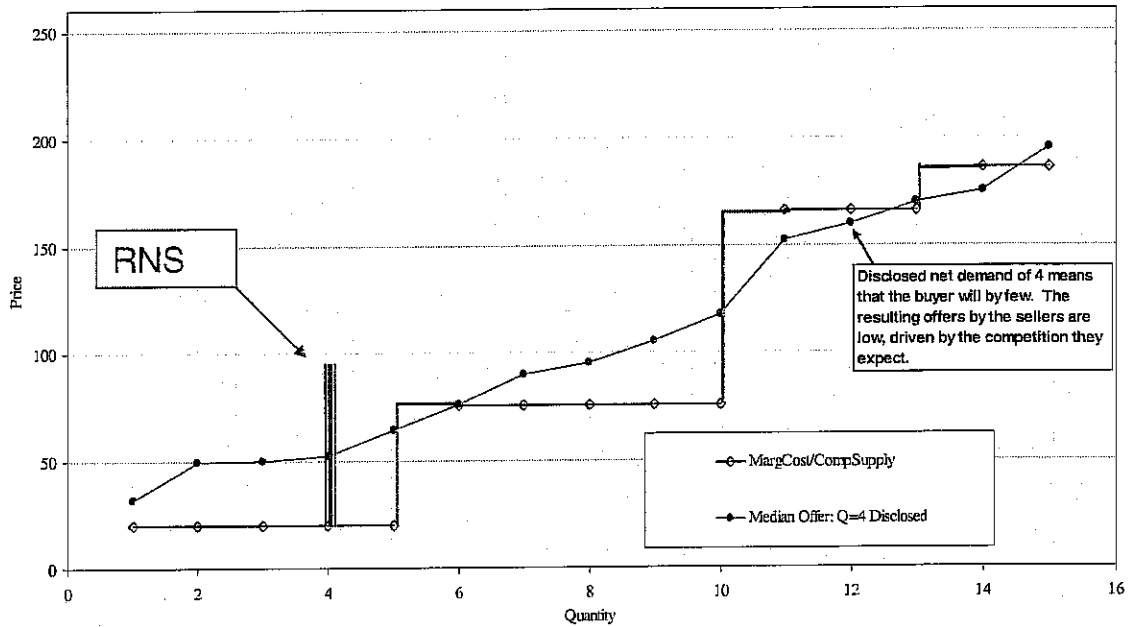


Figure 7B

Fig. 7 B

Median Offer Schedules During Final 21 Periods (2 Disclosure Sessions Pooled): The Higher is the Net Demand Disclosed The Higher Will Be the Asking Prices Of Sellers At Procurement Auction

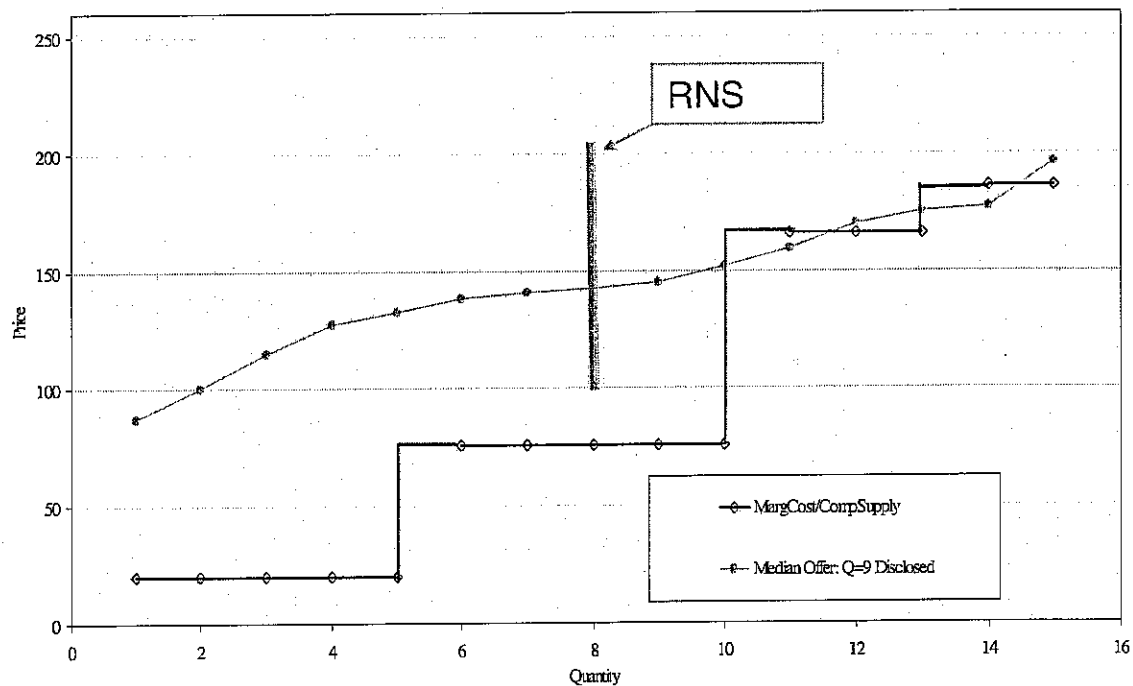


Figure 7C

Fig. 7 C

Median Offer Schedules During Final 21 Periods (2 Disclosure Sessions Pooled): The Higher is the Net Demand Disclosed The Higher Will Be the Asking Prices Of Sellers At Procurement Auction

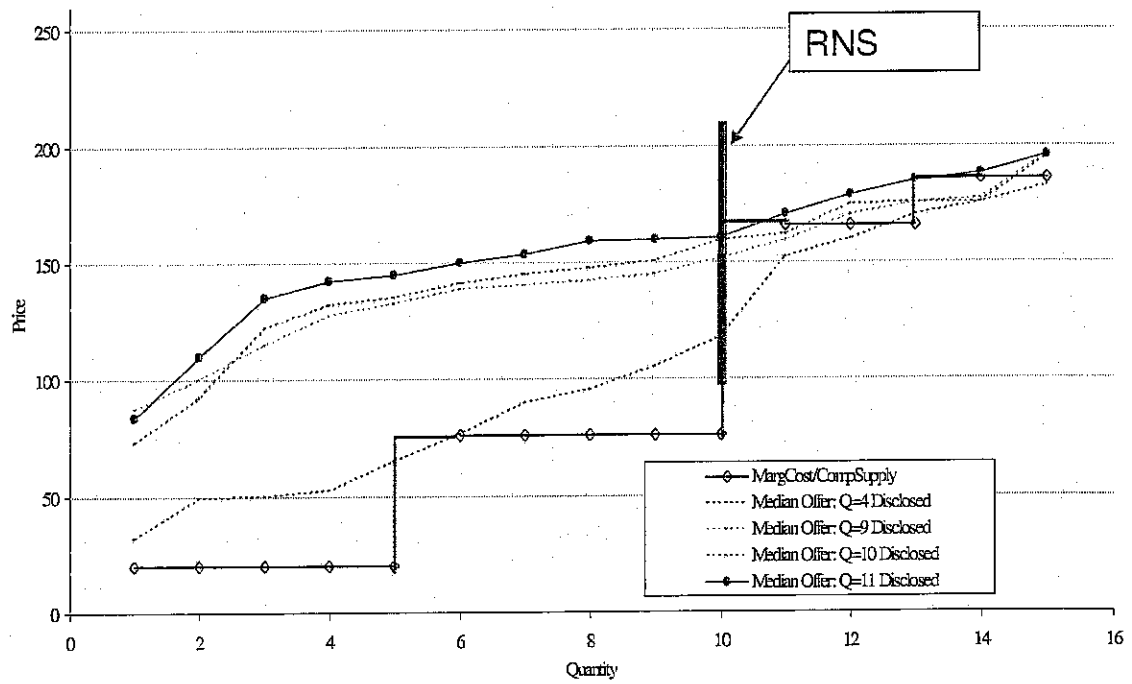
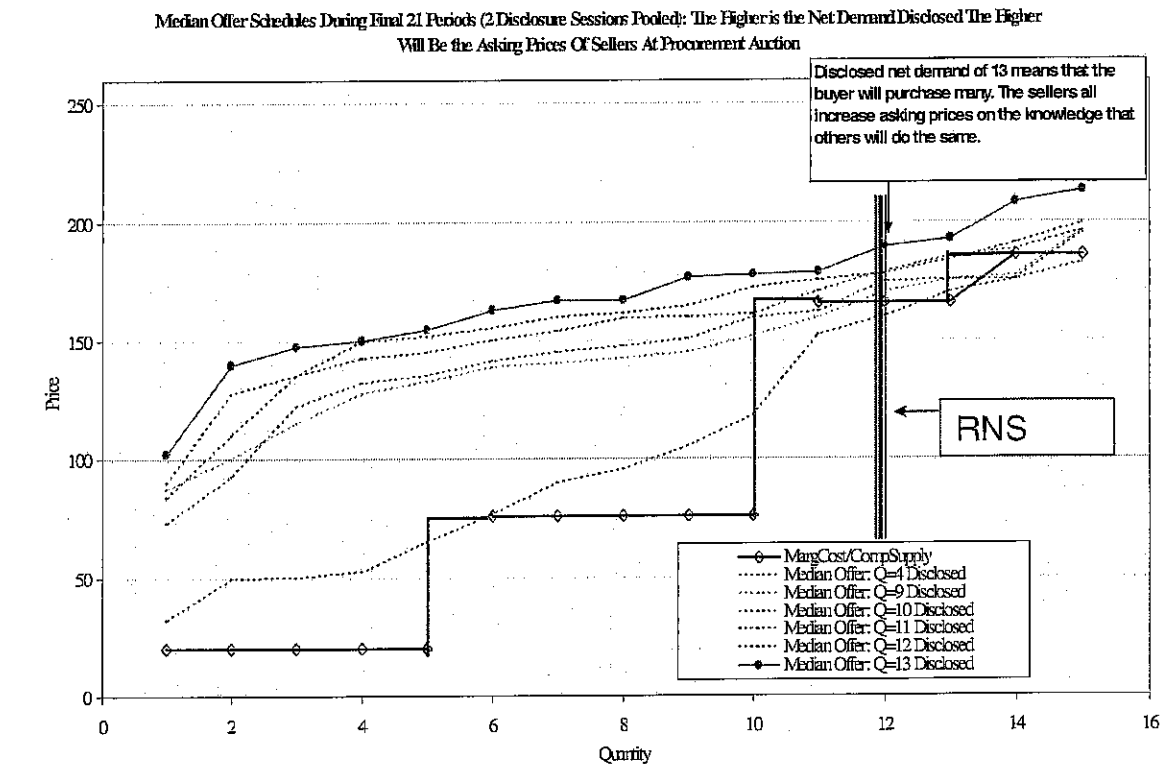


Figure 7D

Fig. 7D



In other words, the behavior of bidders at auction is sensitive to their beliefs about the behavior of other bidders, and those central beliefs are coordinated by the announcement of the RNS. This particular feature of behavior is no mystery. It is a fact that has been demonstrated countless times and in many contexts, as was illustrated in the paragraphs above.²⁷ It is, in fact, so consistent with common sense and daily

²⁷ An active study of the details of this phenomena has existed for years and is often referred to as coordination problems. See Jack Ochs, Chapter 3: Coordination Problems in John H. Kagel and Alvin E. Roth (editors), *Handbook of Experimental Economics*, Princeton University Press, 1995. The phenomenon can be clearly seen in the behavior of futures markets. For the first experimental demonstration, see Robert Forsythe, Thomas R. Palfrey and Charles R. Plott, "Futures Markets and Informational Efficiency: A Laboratory Examination," *Journal of Finance*, XXXIX (4), September 1984,

(Continued)

1 experiences that it is remarkable that it even needs to be demonstrated. As the RNS
2 grows, so do the asking prices in the bids. That is, as the suppliers are made aware that
3 the gap between needs and available capacity is small they increase the amount they bid
4 and the cost to the buyer goes up. They are coordinated simply by the announcement of
5 the RNS.

6 The overall consequence for the buyer and the consuming public is clear.
7 When the IOU must buy small quantities, the prices are low, but when it must buy large
8 quantities, the prices are high.

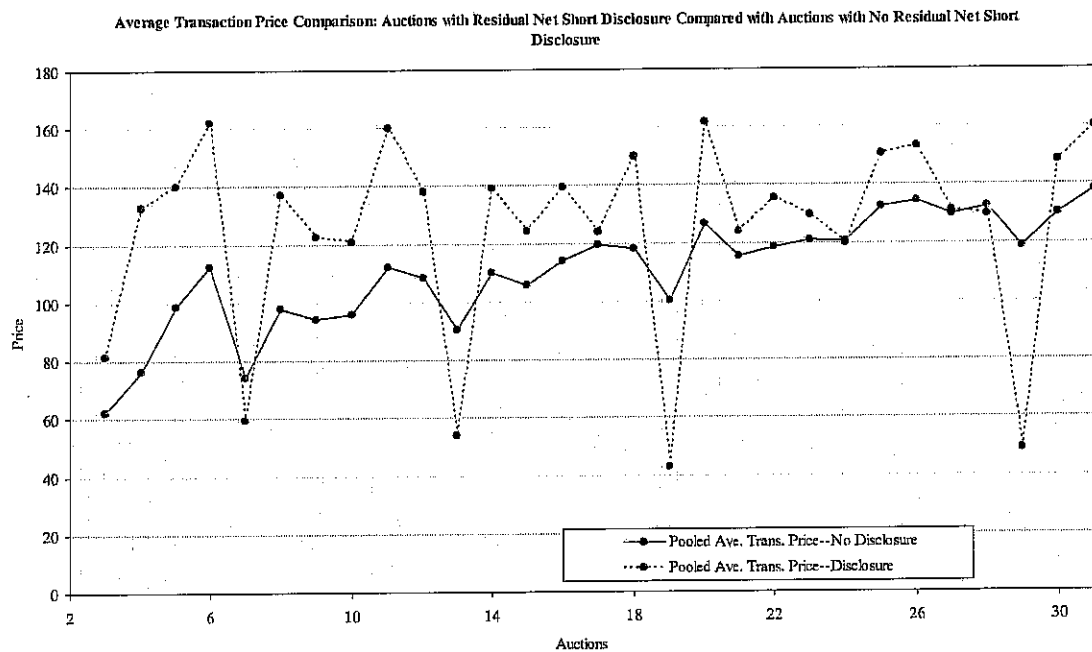
9 **RESULT 3: The implications of forced disclosure of RNS are: (1) under**
10 **conditions of tight supply (large RNS), the prices paid by the buyer will be**
11 **higher than would be the prices had the RNS not been disclosed; (2) under**
12 **conditions of abundant supply (low RNS), the prices paid by the buyer will be**
13 **lower than would be the prices had the RNS not been disclosed.**

14 These implications of forced disclosure are illustrated in Figure 8. The figure
15 contains the average price paid under different levels of disclosed RNS. When supplies
16 are abundant, that is, the RNS is small, the bids will be low and the prices of the
17 procurement will similarly be low. When the RNS is high, the IOU must buy large
18 quantities, the prices offered to the IOU at the procurement auction will be high. Thus, as
19 stated above, when the IOU only buys small quantities the prices are low, but when it
20 wants large quantities the prices are high and these facts are independent of whether or
21 not the market has the capacity to supply the needs. Figure 8 illustrates how the average
22 price varies with the announcement of the RNS.

Continued from the previous page

955-81. It can also be seen in much more complex and interrelated systems. See Charles R. Plott and Dean V. Williamson, "Markets for Contracts: Experiments Exploring the Compatibility of Games and Markets for Games," *Economic Theory* 16, 639-660 (2000).

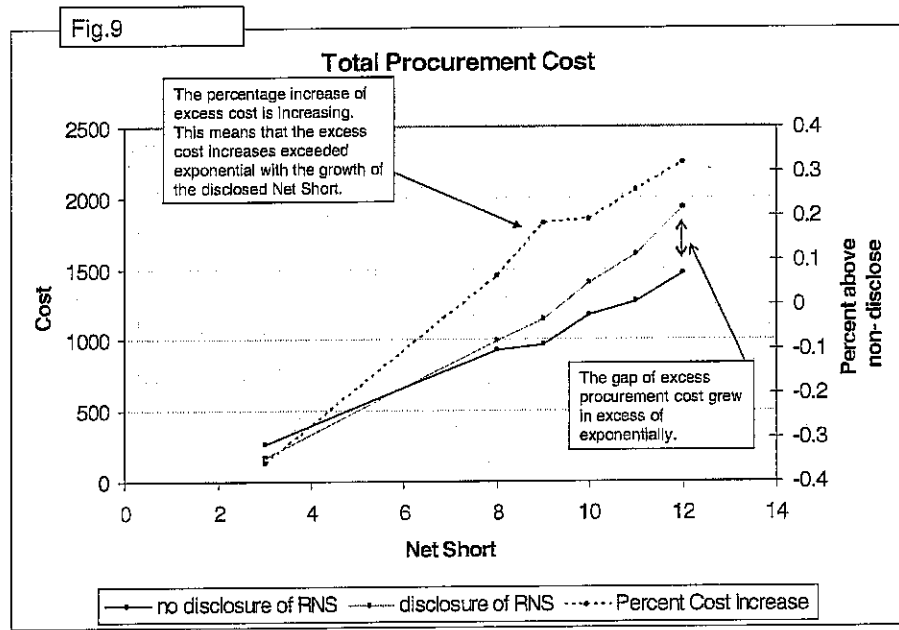
Figure 8



The impact of the disclosure of RNS on total procurement cost can be dramatic. The impact is the combination of increased prices due to the disclosure of Residual Net Short when RNS is large coinciding with the need for increased purchases. The effect is multiplicative. When the RNS is large, the procurement is large and the prices at all levels of potential procurement are high. When the RNS is small, the procurement is small and the prices at every level of procurement are small. The excess expenditure gap shown in Figure 9 is the difference between procurement cost when RNS is announced and procurement cost when RNS is not announced. Result 4 and Figure 9 illustrate the dramatic possibilities.

RESULT 4: The excess expenditure gap grows at a more than exponential rate with the size of the RNS. That is, the percentage by which expenditures under disclosure exceeds expenditure under non-disclosure increases as the size of the RNS grows.

Figure 9



13

Since the RNS is expected to grown in upcoming years (due primarily to the expiration of existing contracts), its disclosure is likely to impose a severe burden on the consuming public.

Some might mistakenly suggest that such patterns of behavior can be used for strategic revelation of the RNS by the IOU. That is, the IOU's customers are better off when the RNS is small, so the IOU should announce this fact when that is the case. The problem with such a policy is that the failure of an IOU to make such an announcement would in and of itself signal a large need and thereby induce price increases exactly at the time when the IOU will procure a large quantity. Moreover, as a practical matter, once the confidential information is revealed (for example, when the RNS is small), arguments that it is confidential and cannot be revealed (when the RNS is large) are vitiated. Therefore, the consuming public is better off leaving the suppliers with uncertainty about

1 the IOU's procurement plans. The prices paid by the public and the overall cost to the
2 public will on average be lower if the RNS is not revealed.

3 **D. Explanation of Results – Why Does It Happen?**

4 The public disclosure of the residual net short has two effects.²⁸ First, the
5 announcement coordinates the strategies of suppliers and creates common expectations.
6 The announced RNS reveals the quantity at which market demand price drops rapidly,
7 reflecting the inelasticity of demand. Total industry capacity is well known to all
8 participants (e.g., the CEC reports such information in aggregate already) so when RNS is
9 disclosed, **suppliers** know the quantity scale-back of supply that will produce dramatic
10 price increases. The more precise are the data that reveal the RNS, the better coordinated
11 and accurate are the expectations. Moreover, all know that if supplies are less than the
12 RNS quantity then the buyer will be forced to pay a high price. More importantly, all
13 suppliers know that all other suppliers know these facts. If other suppliers are acting in
14 their self-interest, as it is appropriate to assume, then all suppliers know that as the
15 public information indicates that the market is tight, other suppliers will bid higher, and
16 thus any individual supplier also has an incentive to bid higher. These properties are the
17 coordination features of the modern theory of Bayesian games that are used extensively by
18 the authors to which Ms Frayer appeals.

19 There is a second effect. A small RNS is the functional equivalent of the buyer
20 becoming a supplier (from previous purchases) against whom suppliers for the
21 procurement at hand must compete. It is a well known property of game theory that the
22 aggressiveness of bidding increases with the number of competitors.²⁹ Thus, from the

²⁸ Of course, if collusion or conspiracy is involved, additional principles become operative.

²⁹ James Cox, V.L. Smith and James Walker, "Theory and Individual Behavior in First Price Auctions"
Journal of Risk and Uncertainty, 1 (1988) pp. 61-99.

1 point of view of a single supplier, when the RNS is low it is the functional equivalent of
2 many suppliers and competitive pressure will dictate low bids. If the RNS is high, then
3 from the point of view of a single supplier there are fewer competitors, so the supplier in
4 question can safely bid higher.

5 **E. Interpretation Of The Results - What Do They Mean?**

6 The basic principles tell us that the impact of the forced disclosure of RNS
7 coordinates the suppliers and removes uncertainty from each supplier about the beliefs of
8 other suppliers. By contrast, the testimony presented by the CEC staff, based on an
9 irrelevant theory of risk aversion, is so far off the mark that a discussion about the role of
10 risk aversion is needed. Indeed, Ms. Frayer has the economics exactly backward.

11 The reduction of uncertainty about the strategies of other participants and the
12 likelihood of a sale itself, when taken alone, is harmful to the buyer and thus helpful to
13 the suppliers. It is the uncertainty about the behavior of competitive suppliers, together
14 with the risk associated with being beaten by competitors (and possibly selling nothing),
15 that are important driving forces in how competition, especially in an auction market,
16 produces desirable results from the point of view of the procuring agent. In a procurement
17 market, the risk aversion of suppliers (the risk of losing to the competition and making no
18 sale) drives prices down. The basic principles at work in a procurement auction, where
19 the bids are tendered as offers to sell, are also at work in auctions designed as a sale,
20 where the bids tendered are offers to buy, only the effect is the opposite. If bidders in a
21 procurement auction are risk averse, the unpleasant risk of losing the sale in a
22 procurement auction forces the suppliers to lower prices. By contrast, if the auction is
23 organized as a sale and if the buyer bidders are risk averse, then the unpleasant risk of
24 losing the item to a competitive buyer induces the buyer to put a premium on the bid. In
25 other words, risk aversion influences the suppliers to make greater concessions, pushing
26 prices down, contrary to the confused claims of Ms Frayer, who claims that risk aversion
27 causes risk premiums to be added to the bids of suppliers. She has confused the role of

1 risk aversion in a procurement auction with the role of risk aversion in sales where the
2 bids are tendered by buyers.³⁰ This phenomenon of risk aversion in auctions is well
3 known and in fact its discovery and documentation figured importantly in the award of a
4 Nobel Prize.³¹

5 Thus, the implication of the disclosure, even if the disclosure is a refinement of
6 existing information, is harmful to the buyer under tight market conditions because it
7 reduces the suppliers' uncertainty thereby increasing coordination among suppliers and
8 reducing competition. Under conditions of tight supply, a greater refinement results in
9 more damage to the buyer. It is important to note that the policy of forced disclosure also
10 damages whatever market discipline might be provided by new entrants because the
11 entrants are coordinated and informed by the same forced disclosure as other suppliers.

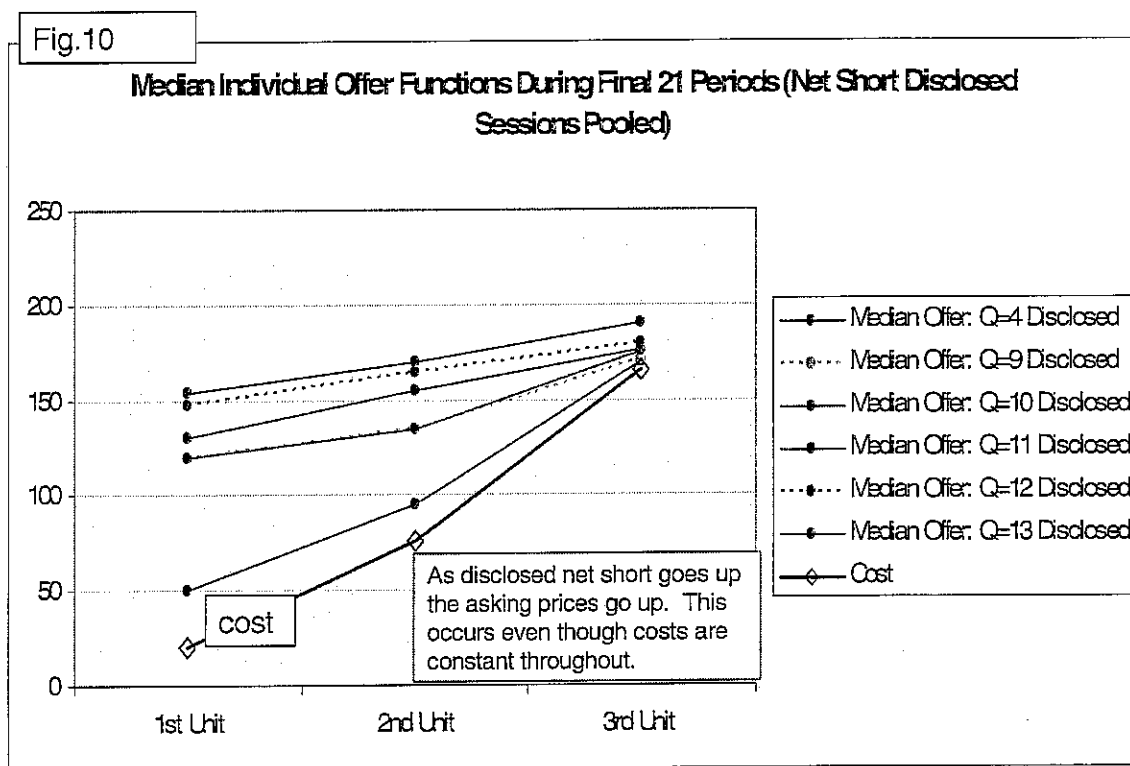
12 The economics and the data tell us that the mechanism works through behavior at
13 the individual level, i.e., the decisions independently made by the individual bidders. The
14 changes in bidding behavior in response to the announced RNS is not an effect due to
15 some special group of bidders who might be conspiring or a single bidder who might be
16 able to exert market power. The net consequences of the two effects outlined above is for
17 each of the bidders to adjust its bids in response to the announced RNS and these
18 consequences are illustrated by the behavior observed in auctions and represented in
19 Figure 10. In this example, each bidder has a capacity to supply three units. The first

³⁰ See CEC/Frayer p.4 ("...including lower prices as a result of lower embedded risk premiums in the offers of suppliers...") and p. 17. ("Thus, risk aversion appears to be a good characterization of market participants in these procurement processes, suggesting that information dissemination which reduces uncertainty would have beneficial repercussions for buyers and thus for rate payers.")

³¹ Cox, James C. and Ronald L. Oaxaca, "Is Bidding Behavior Consistent with Bidding Theory for Private Value Auctions?", in R. Mark Isaac (ed.), *Research in Experimental Economics*, vol. 6 (Greenwich: JAI Press, 1996). "Advanced Information on the Prize in Economic Science 2002" (17 December 2002, The Royal Swedish Academy of Sciences, Information Department, P.O. Box 5005, SE-104 05 Stockholm, Sweden).

unit is the low cost unit, after which cost increases for the following two units. Thus the bottom curve shown in Figure 10 is the (approximate) marginal cost as seen from the point of view of a typical supplier.

Figure 10



RESULT 5: The impact of the disclosure of RNS appears in the bidding patterns of the individual agents independently. Collusion, market power, or conspiracy is not necessary for suppliers to increase prices in response to an RNS announcement.

The data shown in Figure 10 are the averages of asking prices submitted by all sellers for each of the three possible units of supply. In technical terms, these data are known as the "bid functions" of suppliers. The average of supplier bids is low when the RNS is low. That is, when the announced RNS is low the suppliers automatically know that supplies are plentiful and thus keep their bids low, so they will not lose to intense

1 competition. As shown in the figure, the bid functions go up as the RNS gets larger. The
2 effect is clearly evident in the figure. Not only does the asking price for the marginal unit
3 (i.e., the unit that is exposed to the most intense competition) go up, the asking price of all
4 units goes up. As shown in the figure, the natural tendency of bidders in response to a
5 public announcement that the supply is tight is for all bidders to raise bids. It makes
6 common sense, it makes scientific sense and the reaction is consistent with behavior from
7 many activities in life. If you know others are going to hold out for higher prices, you will
8 tend to do so yourself. If you think that markets are going to be tight, and thus that prices
9 will be high, you do not make offers at low prices.

10 The impression that can be drawn from the figures is clearly supported by
11 statistical analysis and common sense. The figures demonstrate the general, coherent and
12 consistent pattern explained throughout my testimony. The bidders typically bid lower on
13 the low cost units if the supply is plentiful (RNS is small) but their markup for all units
14 goes up as they are made aware of whether the RNS is large. If RNS is large, they know
15 that their lowest bid will almost certainly be taken so they increase it as much as they can
16 without the risk of having it rejected. They then use the higher cost units to bid high and
17 explore the possibility of receiving a very good price.

18 **F. Ms. Frayer's Analysis Fails**

19 **1. Ms. Frayer relies on a demonstrably incorrect theory of the facts and** 20 **impact of market organization.**

21 In my declaration and my study with Dr. Cason, I addressed multiple
22 markets, multiple buyers, and multiple sellers and demonstrated the impact of forced
23 disclosure. Ms. Frayer claims that the relevant markets to study are auctions, not
24 realizing that the negotiated markets are a series of two-sided auctions. The analysis
25 above is focused directly on auctions and, contrary to Ms. Frayer's testimony, the effect of
26 the disclosed RNS is obvious. Auction markets respond just like other markets.

1 Ms. Frayer suggests that suppliers number in the dozens but, in fact, a
2 typical auction has a significantly smaller number. She is confused about the number of
3 suppliers and the numbers that typically must be coordinated. It is important to note,
4 however, that because the CEC is proposing that the annual and quarterly RNS be made
5 public the coordination is extended regardless of the numbers. **As was explained above,**
6 **the public announcement produces a signal about the state of the market,**
7 **whether supplies are abundant or tight relative to demand. This signal will**
8 **influence the behavior of all sellers who receive it.**

9 Ms. Frayer's model leads one to believe that the announcement of the whole
10 demand function, i.e., the willingness to pay for the procurement (at the margin) is a
11 crucial variable. In the auctions studied and reported here the demand function was not
12 announced. Only the RNS was announced. Clearly, contrary to the model that Ms.
13 Frayer uses, the announcement had the effect of increasing prices. The announcement
14 need only give a qualitative measure of the market conditions and while more quantitative
15 information might have an even more dramatic effect, especially if there is collusion, the
16 qualitative indicators of market collusion are sufficient to hurt the California public.

17 2. **Ms. Frayer relies on an incorrect model of the mechanism through**
18 **which the effect works.**

19 Ms. Frayer testifies that increased prices will only occur under conditions of
20 collusion, conspiracy, or the exercise of market power. This conclusion is demonstrably
21 wrong. Indeed, she devotes a substantial part of her testimony to dwelling on economic
22 conditions that might make collusion difficult and theories about such conditions.³² While
23 collusion is certainly possible, and the announcement of the RNS would help facilitate
24 collusion by clearly identifying the targets of supply cutbacks, collusion is not necessary

³² See CEC/Frayer pp. 22 - 23.

1 for the announcement to have an effect. The effect of revealing the RNS need have
2 nothing to do with collusion and conspiracy, but it has everything to do with coordination
3 and the creation of common expectations. Thus, Ms. Frayer's long discussion of the
4 theoretical conditions under which one might find collusion or the conditions under which
5 collusion might not be expected has nothing at all to do with my analysis. Furthermore,
6 the irrelevance of the theory she articulates is clearly demonstrated by the data presented
7 here today. No collusion existed in the auctions which I discuss here, yet the
8 announcement of the RNS has a profound impact.

9 **3. Ms. Frayer's understanding of bidding theory and information**
10 **economics is strikingly wrong and the misunderstanding of the**
11 **theory has guided the staff to exactly the wrong conclusions.**

12 Ms. Frayer makes a serious mistake in her interpretation of bidding theory
13 and information economics: she takes general descriptions of a model that is completely
14 unrelated to the issues at hand ³³ and misapplies the conclusions of the model. Her basic
15 error rests on an inappropriate assumption that the theoretical discussions about common
16 value auctions and the role of information in the context of common value auctions are
17 applicable. The basic distinction is between: (1) the role of information about the behavior
18 of a competitor in an auction, in this case the amount that the buyer is planning to buy,
19 and (2) information about the features of the items being traded. The distinction is as
20 basic as the difference between uncertainty about the plans of a competitive card player,
21 on the one hand, and uncertainty about the rules of the card game being played, on the
22 other hand. Specifically, she has confused information about the plans of the buyer, the
23 RNS, on the one hand with information about the features of the product, the electricity,
24 that the buyer is buying. .

³³ Paul Milgrom, Putting Auction Theory to Work, Cambridge, 2004.

1 Clearly, information about the features of the commodity that is being
2 purchased or sold in the power market is very different from information about the
3 quantity that a buyer might want. The difference is directly analogous to the information
4 about the amount of minerals in the ground in auctions for mineral rights with
5 information about how many rights are to be bought or sold.³⁴ Ms. Frayer makes the
6 dramatic mistake of applying to the latter the theory of common value auctions that was
7 developed only for application in the former. All of the conclusions that she draws from
8 this error are simply wrong. They are wrong in theory and they are wrong in fact.

9 Thus, common value auctions have nothing to do with forced disclosure and
10 the information about the quantity that the buyer wants to buy, or in the case of selling
11 auctions where the theory was developed, the theory has nothing to do with the quantity
12 that is offered for sale. In the common value case, which has nothing to do with the
13 disclosure of the RNS, the participants might have information from tests or the
14 performance of nearby fields, all of which gives information about the properties of the
15 item being bought or sold. The models apply to discussions about whether or not such
16 **information about features of the product** should be released and the implications of
17 any such action. This type of information has nothing at all to do with the plans of a
18 competitor or the bidding strategies that a competitor might plan. It is important to note
19 that there is nothing about forced disclosure of RNS that has information about the
20 features of the item being sold. Power is power regardless of how much is transacted.
21 Thus, the common values models cannot be applied to the information that the CEC wants

³⁴ Milgrom puts it clearly (p.162). He begins by noting that "private value auctions" and "common value auctions" are polar opposites. "In auctions for oil and gas drilling rights (and other mineral rights), the value of the rights to the bidders depends mainly on how much oil and gas is in the ground and how easily it can be extracted." ... "Most often, the [common value] models assume that the good has exactly the same value to each bidder." Milgrom then continues to explain that it is this common value that is the source of uncertainty and it is to information about that common value that the theory applies. Thus, the features of the item being bought are the sources of uncertainty and risk.

1 to force the IOUs to disclose and to apply the model to such a problem is a rather dramatic
2 mistake.

3 Ms Frayer's references to the benefits of "information refinements", the
4 emphasis she places on "new information", "publicity effects" and "weighting effects" are
5 just wrong. This can be most clearly assessed in her observation, "If the revelation of 'new'
6 information by the buyers reduces private information held by certain suppliers, it will
7 encourage more intense competition and increase the expected profits for the buyers (this
8 is known as the 'publicity effect' in auction theory)."³⁵ The error here is uncovered when
9 one asks "new information about what?" The theory she is using applies to information
10 about the features of the item for auction, e.g. the amount of oil in the ground, and indeed
11 one can imagine that if a better fix on the oil in the ground was provided to all bidders, the
12 seller might be made better off. But, in the case of forced disclosure of RNS there is no
13 analog to information about the features of the item at auction. The information
14 contained in the unilateral disclosure by the buyers of the RNS is about the strategies of
15 one of the participants. Her sweeping statements about the consequences of the revelation
16 of information about the RNS are just false and follow from a misapplication of theory.

17 It follows that all discussions of the winners curse, cost reduction, bid
18 reduction due to risk, etc. contained in Ms. Frayer's testimony are also wrong. Indeed, the
19 winner's curse is an interesting phenomenon, but it has absolutely nothing to do with the
20 disclosure of the RNS. Interestingly enough, I was one of the first to demonstrate the
21 existence of the winner's curse in procurement auctions.³⁶ I can categorically state that
22 the winner's curse has absolutely nothing to do with the problem at hand. Any reference
23 to it or any deduction from it is, in my opinion, the most elementary of errors.

³⁵ CEC/Frayer, p. 15.

³⁶ Barry Lind and Charles R. Plott, "The Winner's Curse: Experiments with Buyers and with Sellers", *The American Economic Review*, 81 (1), March 1991, 335-46

1 4. Ms. Frayer's testimony on the role of refinements is based on a
2 completely inappropriate theory.

3 Because Ms. Frayer's analysis is based on the wrong theory of industrial
4 organization and an improper application of bidding and information theory, the
5 conclusions about the impact of refinements are also incorrect. When an appropriate
6 model is applied, the impacts of refinements of information are exactly the opposite of the
7 claims Ms. Frayer makes and the existence of risk aversion also has the opposite effect of
8 that claimed in her testimony.

9 A short discussion of common value situations will make this clear. The
10 theory itself was developed from the point of view of competing buyers facing a single
11 seller, as opposed to a procurement process. Consequently, the examples of the concepts
12 are most easily found in that context. Milgrom uses an example of neighboring tracts of
13 land and bidding for mineral rights, say oil, on one of them. If the seller knows something
14 about the amount of oil in the ground for the tract at auction and if the seller releases this
15 information publicly to the buyers, the bidding behavior in the auction can change in two
16 ways. First, all bidders know that all other bidders have this information, and all bidders
17 expect everyone to use it and adjust bidding behavior accordingly. Thus, an individual
18 bidder will change his or her behavior in the anticipation of changes in the behavior of
19 others. This is a variation of the "publicity effect" that Ms Frayer incorrectly references.
20 Everyone knows that everyone else knows that the leases are more or less valuable and
21 will adjust bids to accommodate that fact. The other effect, the "weighting effect",
22 indicates that the new information might be combined with information a bidder already
23 has and thus be used to more precisely estimate the common value of the item at auction.
24 The example used by Milgrom is information about the oil in a neighboring property. If
25 one or more bidders have information about the oil in the neighboring tract the new
26 information can be combined with the existing information to get a better estimate of the
27 common value of the tract at auction. It is the nature of this combining of information

1 about the features of the item at auction that produces the weighting effect. Now, it is
2 important to notice that this discussion has nothing at all to do with the public release of
3 RNS because the RNS has nothing to do with the features of the items at auction.
4 Electricity is electricity and the suppliers have their own cost estimates.

5 When the appropriate model is applied to the public release of the RNS the
6 results are exactly the opposite of those claimed by Ms. Frayer in her testimony and these
7 effects appear dramatically in the data I present in my testimony. The announcement
8 does influence supplier behavior and in tight markets the suppliers know that other
9 suppliers will tend to bid high. Thus, each individual will bid high and overall the group
10 of bids faced by the IOU will be higher as a result of the announcement. Thus, to the
11 degree that the RNS is a refinement, it reduces the uncertainty about what other bidders
12 know, and thus reduces uncertainty about what they are likely to do. That is, if the RNS
13 is large, there is a tight market and all suppliers will increase their bids and the buyer
14 will be harmed. This is exactly the opposite effect that Ms Frayer obtains from an
15 incorrect application of theory.

16 Furthermore, risk aversion, which Ms. Frayer claims works against the
17 buyer, actually works in the opposite direction. As was explained in my testimony above,
18 in an auction situation in which the features of the item for sale are not the subject of the
19 risk, risk aversion operates to the disadvantage of the bidders. That is, risk aversion will
20 work to the advantage of the IOU. It follows that in times of tight supply a reduction of
21 risk to suppliers (in the sense of the risk of losing the auction) will work to the
22 disadvantage of the IOU. IOUs are also disadvantaged in times of plentiful supply by the
23 reduction of risk, holding information constant, because the more certain a bidder is about
24 the action of others, the more closely the bidder can create gains without the risk of loss.

1 Ms. Frayer mentions the Spence model, which by the way I was the first to
2 test experimentally,³⁷ but it has absolutely nothing at all to do with the disclosure of RNS.
3 The Spence model is a theory about how a party (like a business firm) can structure
4 incentives so that potential employees with desirable qualities (possibly like native
5 intelligence or motivational level that cannot be observed by the potential employer) would
6 reveal themselves through a process of self-selection (such as levels of education at
7 difficult schools). The reference used in the Frayer testimony is completely misplaced and
8 her deductions from the application are exactly the opposite of what economics predicts.

9 **5. Ms. Frayer's analysis of the incentives for long term investments is**
10 **internally inconsistent.**

11 Ms. Frayer claims that better information will attract investment. In making
12 this argument Ms. Frayer implies basic inconsistencies of the analyses. Ms. Frayer claims
13 that the disclosure of RNS will make investment more attractive.³⁸ That means that
14 either the cost of building new generation goes down or the revenue goes up. Since the
15 disclosure of RNS has no impact on cost (Ms. Frayer's analogies with risk aversion are
16 completely misplaced), any incentives for further investment must come from increased
17 expected revenues. But that means that the incentives for increased investment must
18 come from increased prices paid by consumers. Now, whether or not the increased prices
19 are sufficient to attract investment is a questionable issue that has not been addressed.
20 However, what we have here is an admission that the impact of the disclosure is to
21 increase prices, and that is exactly the substance of my testimony.³⁹

³⁷ Ross Miller and Charles R. Plott, "Product Quality Signaling in Experimental Markets", *Econometrica*, 53 (4), July 1985, 837-72.

³⁸ p.4, "The aggregated summary tables provide useful and very important signals for new investment. Such signals will motivate new investment in generation, expand the competitive opportunities for buyers to procure energy, and thus provide secure and reasonable priced supply for ratepayers in the future."

³⁹ It is of interest to note that Frayer quotes my testimony out of context, neglecting the fact that I was pointing out that new investment is attracted through higher profits. p.27.

1 **G. Conclusion**

2 To conclude my testimony, I will summarize what I described at the outset. All
3 relevant economic theory, experimental economics, and common sense yield the same
4 outcome: Disclosing buyer information to sellers leads to higher prices being paid by the
5 buyers, while providing new profit opportunities for sellers. I strongly disagree with Ms.
6 Frayer's conclusions that are to the contrary.

1 III.

2 THE CEC'S TESTIMONY FAILS TO CONSIDER THE UNIQUE POSITION
3 OF CALIFORNIA'S IOUS

4 A. On Confidentiality Issues, The CEC Erroneously Compares
5 California's IOUs With Other Utilities In Dissimilar Situations

6 Dr. Michael Jaske claims that "the conventional standard for documenting
7 resource needs around the West is for utilities themselves to release at least as
8 much information as has been proposed" by the California Energy Commission.⁴⁰
9 In support of his position, Dr. Jaske cites California history prior to deregulation,
10 identifies several out-of-state IOUs which have allegedly released similar
11 information, and discusses a broad category of publicly-owned utilities – and then
12 asserts that present-day California IOUs should follow their lead.

13 However, upon closer examination, each and every one of the examples Dr.
14 Jaske cites is of entirely different circumstances than what California IOUs face
15 today. Dr. Jaske first attempts to compare today's market with the market that
16 existed in prior years. Dr. Jaske claims, "these data were prepared and publicly
17 submitted on a regular basis to the Energy Commission from 1975 to 1997."⁴¹ The
18 question that needs to be asked and answered is why this practice changed. The
19 answer is simple: deregulation. As CEC Staff's July 2005 report⁴² explains, the
20 California electricity industry has "undergone monumental change after nearly a
21 century of vertically-integrated stability." It is incredibly naïve for Dr. Jaske to
22 ignore these fundamental changes in the California electricity market. When
23 deregulation began, California investor-owned utilities divested 100 percent of their

⁴⁰ CEC/Jaske, p. 1.

⁴¹ CEC/Jaske, p. 4.

⁴² CEC Staff Report, "Revised California and Western Electricity Supply Outlook Report", July 2005, p. 4.

1 gas-fired generation. This act placed a greater reliance on markets than utility
2 generation to provide power and transformed California's IOUs into wholesale/retail
3 middlemen – potentially forever. The fact that IOUs have disclosed detailed
4 planning information prior to deregulation has no relevance whatsoever to today's
5 market conditions.

6 Moreover, unlike every single entity cited by Dr. Jaske, California's IOUs can
7 no longer rely on utility-owned generation for the vast majority of their power
8 needs. In contrast to California, where only about 30-35 percent of the generation is
9 utility owned, each non-California IOU Dr. Jaske has identified has between 79 to
10 91 percent utility-owned generation (with a weighted average of 87 percent utility-
11 owned generation).⁴³ Thus, California IOUs are much more reliant on the market
12 to meet their customer needs than any other IOU Dr. Jaske cites. These market
13 realities cannot be ignored, yet Dr. Jaske does just that. Whether California IOUs
14 rely on short-, medium-, or long-term contracts is irrelevant. The pricing of
15 contracts of any duration can and will be impacted through information disclosure.
16 To put it into CEC staff terms, none of the investor-owned utilities outside of
17 California that Dr. Jaske cites has been exposed to “monumental change,” like the
18 California investor-owned utilities have.

19 The chart below shows the percentage of utility-owned generation for each of
20 the utilities cited by Dr. Jaske. It also shows the status of deregulation in the state
21 where the utility is sited.

⁴³ The only exception to significant utility generation is Northwestern Energy, which does not disclose its residual net short. Dr. Jaske points out this fact in his testimony in Table 2.

Table III-1

Utility	Year of Info	Total Resource (MW)	% Utility-Owned	Status of Deregulation	Source
Arizona Public Service	2007-2011	6157	88%	(Sept 2002) The Arizona Corporation Commission ordered APS to cancel any plans to divest interests in any generating assets.	http://www.eere.energy.gov/femp/program/utility/utilityman_elec_az.cfm http://www.aps.com/files/rfp/2005_Re liability_RFP_Final.pdf
Avista	2004-2023	2190	91%	In May 1999, the PUC established competitive practice standards for Avista and set up a registry of gas marketers who wish to provide service within the utility's service area. However, there are no legislative or regulatory processes underway to implement retail gas choice for residential or small commercial customers in Idaho.	http://www.eere.energy.gov/femp/program/utility/utilityman_ng_id.cfm http://avistautilities.com/assets/resources/plans/electric/2003_IRP_Appendices.pdf
Idaho Power	2003	1720	79%	(Dec 2003) The Legislation Council Committee issued its final report in January 1999, recommending a slow approach to retail competition. There is no new action on the status of deregulating the electric power industry in Idaho.	http://www.eere.energy.gov/femp/program/utility/utilityman_elec_id.cfm http://www.idahopower.com/pdfs/energycenter/irp/2001_technical_appendix_final.pdf

PacifiCorp	2006-2015	7000	89%	<p>(March 2002) Oregon law allows all large business consumers to choose to purchase power from their current utility under a regulated cost-of-service rate or purchase energy directly from an alternative supplier. But in Feb 2004, The Commission concluded that the potential problems of offering choice to residential customers outweigh the possible benefits. As of March 2003, PacifiCorp has 0.0 percent Direct Access customer in its service areas.</p>	http://www.eere.energy.gov/femp/program/utility/utilityman_elec_ut.cfm http://pacifiCorp.com/File/File47422.pdf http://www.pacifiCorp.com/File/File47424.pdf http://www.eia.doe.gov/cneaf/electricity/chg_str/restructure.pdf
Portland General Electric	2005-2013	2057	85%	<p>(March 2002) Oregon law allows all large business consumers to choose to purchase power from their current utility under a regulated cost-of-service rate or purchase energy directly from an alternative supplier. But in Feb 2004, The Commission concluded that the potential problems of offering choice to residential customers outweigh the possible benefits. As of March 2003, PGE had 0 percent Direct Access customers in its service area.</p>	http://www.eere.energy.gov/femp/program/utility/utilityman_elec_or.cfm http://www.portlandgeneral.com/about_pge/regulatory_affairs/findings/pdfs/rp_supplement.pdf http://www.eia.doe.gov/cneaf/electricity/chg_str/restructure.pdf
Public Service of Colorado	2003	4024	87%	<p>In November 1999, the Colorado General Assembly established the Electric Advisory Panel that retail competition was not in the best interests of Colorado's residential, small business, and agricultural customers. No significant government effort is currently underway to deregulate electric utilities in this State.</p>	http://www.eere.energy.gov/femp/program/utility/utilityman_elec_co.cfm http://www.xcelenergy.com/docs/corpcomm/Document1of4.pdf http://www.xcelenergy.com/docs/corpcomm/Document4of4.pdf

Puget Sound Energy	2006 (Forecast)	2700	82%	(April 2001) The Washington Utilities and Transportation Commission announced a settlement between Puget Sound Energy and the utility's large industrial customers. The utility's six largest industrial customers will be allowed to buy power from any source, including other utilities, power marketers and each other.	http://www.eere.energy.gov/femp/program/utility/utilityman_elec_wa.cfm http://www.pse.com/about/supply/LCP/20050503/LCP_no%20appendices.pdf http://www.pse.com/about/supply/LCP/20050503/Appendix%20G-Electric%20Results.pdf
Sierra Pacific	2003	1536	82%	(March 2001) Indefinite Halt to deregulation. Customers using more than 1MW per month may buy their power competitively with permission from the PUC.	http://www.eere.energy.gov/femp/program/utility/utilityman_elec_nv.cfm

1 In addition, unlike California's IOUs, none of the IOUs cited by Dr. Jaske is
2 at risk today of losing customers to retail competition. They all have stable
3 customer bases for the foreseeable future. California's IOUs, by contrast, are under
4 the uncertain cloud of Direct Access, Community Choice Aggregation, and future
5 core/non-core restructuring possibilities. Again, Dr. Jaske ignores these
6 fundamental facts. Moreover, Dr. Jaske only recommends enforcing the forced
7 disclosure requirement on IOUs, not on any other buyers or sellers in the California
8 market.

9 Third, Dr. Jaske claims that publicly-owned utilities [POUs] are not
10 concerned about whether detailed monthly resource-specific data is kept
11 confidential. Again, Dr. Jaske does not address whether publicly-owned utilities
12 are in a similar or different situation. Fortunately, CEC staff itself sheds light on
13 this subject:

14 The history of publicly owned utilities is very different than that of
15 investor-owned utilities...POU procurement tends to have long-term
16 focus, based on goals of achieving self-sufficiency. POUs tend to own and
17 finance their own generation assets, or have sufficient long-term
18 contractual commitments to meet full resource adequacy requirements
19 over both the short- and medium term.⁴⁴

20 And the report also notes: "[POUs] are required to publicly disclose far less
21 information than their more regulated IOU counterparts."⁴⁵ Additionally, none of
22 the POUs is at risk of losing retail customers as a result of retail competition.

23 In summary, Dr. Jaske's references to other utilities in truth points to
24 fundamental differences, not similarities, of the situation faced by California IOUs.
25 Each of the entities Dr. Jaske refers to has a stable retail customer base and the
26 ability to rely on its own generation to meet customer needs. These utilities have

⁴⁴ CEC Staff Report, "Revised California and Western Electricity Supply Outlook Report," July 2005, p. 55.

⁴⁵ *Id.*, p. 4.

1 the option of not relying on the market to procure incremental resources and
2 therefore, they are not nearly in the same situation as California IOUs. In their
3 circumstances, these utilities are indifferent to the disclosure of market-sensitive
4 data. This is unlike California IOUs, whose reliance on the market for incremental
5 power is substantial and will continue to be so for the foreseeable future.

6 **B. The CEC's Consultant Wrongly Compares California IOUs With**
7 **Deregulated Markets**

8 Ms. Frayer identifies two situations in deregulated markets where entities
9 disclose a wide variety of information, Connecticut Light and Power and New
10 Jersey's BGS auctions. As to Connecticut Light and Power, SCE is aware that
11 every utility in the U.S. is required to provide significant amounts of information
12 related to its operations. The fact that a lot of information is required to be
13 disclosed is not in dispute. However, notably absent from the long list of disclosed
14 information from Connecticut Light and Power is the requirement to disclose the
15 utility's residual net short position, which is the subject of the dispute in this
16 proceeding. The fact that Connecticut Light and Power discloses a lot of other data
17 is irrelevant. The fact that CL&P is not required to disclose its net short position is
18 highly relevant, but completely ignored by Ms. Frayer.

19 New Jersey's regulation of its public utilities is inherently different from
20 anything California regulators have ever contemplated and is not a useful
21 comparison for any purposes. In New Jersey, the utility's customer base was split
22 up and auctioned to the highest bidder. In essence, the retail information was made
23 available to other entities that performed the retailing function. The buyer is the
24 seller. Obviously, this does not compare at all to the CEC's proposal, which would
25 provide market sensitive buyers' information to sellers. The fact that one state
26 chose to auction off a customer base (and an obligation to serve) has no relevance
27 whatsoever to California's situation. More importantly, Ms. Frayer fails to offer any

1 explanation why it should be considered relevant in light of these fundamental
2 differences in market design.

3 Additionally, Ms. Frayer incorrectly claims that California's IOUs know each
4 other's positions. This is just not true. SCE has no idea what SDG&E's and
5 PG&E's net short positions are. SCE presumes that SDG&E and PG&E also do not
6 know SCE's position.

7 **C. The CEC Staff Wrongly Suggests That Because Other Information Is**
8 **Made Public, Market Sensitive Information Should Be Made Public**

9 Dr. Jaske states that "IOUs themselves provide similar data in other
10 planning forums and to the federal government."⁴⁶ This statement is misleading
11 and wrong. Nowhere does SCE provide information related to its market-sensitive
12 retail business, especially bundled customer demand and residual net short
13 position. Dr. Jaske identifies transmission and distribution system information
14 that is disclosed by the utilities, but this is not the same as the confidential,
15 market-sensitive information related to SCE's retail business that staff proposes be
16 disclosed in this proceeding. The transmission and distribution business is largely
17 a monopoly function and therefore can be made available without the same
18 consequences of manipulation. The retail business is not a monopoly function and
19 data disclosure has a direct adverse impact on prices charged by generators, as Drs.
20 Plott's and Cason's numerous experiments conclusively demonstrate.

21 Further, Dr. Jaske states, "The relationship between planning areas to
22 bundled customer loads are easily 'guesstimated' to a few percentage points."⁴⁷
23 While estimation techniques are used in many applications, including electricity
24 markets, the mere fact that these techniques are available (with varying degrees of

⁴⁶ CEC/Jaske, p. 6.

⁴⁷ Id., p. 6.

1 accuracy) is no justification for making the actual data available. Moreover, if one
2 accepts Dr. Jaske's assertion at face value, there is no reason to force the IOUs to
3 disclose their confidential information since it is, according to Dr. Jaske, already
4 easily estimable from publicly available information.

5 Additionally, Dr. Jaske provides misleading references to CPUC orders. He
6 states, "The IOU bundled customer portion of the quarterly energy table that PG&E
7 and SCE opposes [sic] releasing in their appeals of the executive Director contain
8 precisely the same quarterly values that the May 9, 2005 Ruling of ALJs Halligan
9 and Thorson has PG&E and the other IOUs to release."⁴⁸ This statement is wrong.
10 Nothing in the May 9 Ruling requires the release of anything related to bundled
11 customer demand. To the contrary, the May 9 Ruling references "system demand,"
12 and not bundled customer demand.⁴⁹ The CPUC also makes the following
13 statement about the release of residual net short, "Knowledge of the utility's RNS
14 position may enable market participants or competitors to manipulate bid prices, or
15 offering amounts, or take other actions resulting in potentially significant harm to
16 the utilities' ratepayers."⁵⁰ Contrary to Dr. Jaske's assertions, the CPUC has taken
17 positions that are consistent with the IOUs and not the CEC's staff, related to
18 residual net short and bundled customer demand.

19 Moreover, Dr. Jaske provides no basis whatsoever for disclosing the market-
20 sensitive data of one class of LSEs while the data of all other LSEs is kept
21 confidential. To the contrary, Dr. Jaske indicates Energy Service Providers
22 "naturally sought protection for their detailed data."⁵¹ Here Dr. Jaske implies that

⁴⁸ CEC/Jaske, p. 15

⁴⁹ CPUC, Administrative Law Judges' Ruling On Protective Order And Remaining Discovery Disputes, p. 27.

⁵⁰ *Id.*, p. 13

⁵¹ CEC/Jaske, p. 4.

1 he agrees this information should be protected for one class of LSEs, who primarily
2 rely on market purchases to meet their customers' retail needs, but does not even
3 attempt to explain why another similarly situated class of LSEs should have their
4 information made public. This unfair and discriminatory aspect of Dr. Jaske's
5 recommendation is unexplained and unexplainable.

6 Finally, Dr. Jaske asserts that somehow SCE "shirked" its obligation to
7 provide information to FERC.⁵² Dr. Jaske clearly does not understand the FERC's
8 submittal process. SCE complies with FERC requirements by participating in the
9 Western Electricity Coordinating Council regional planning process, which in turn
10 submits a completed Form 714. Again, Dr. Jaske's assertion has nothing to do with
11 providing residual net short data – which is not available at FERC or required to be
12 produced by the FERC – or otherwise disclosing market-sensitive information to
13 generators.

14 **D. The CEC Should Provide Meaningful Data That Will Help Generators**
15 **Know When And Where To Build New Generation And Not Provide**
16 **Market-Sensitive Information That Can Be Used To Drive Up Power**
17 **Prices**

18 The CEC can fulfill its mandate and provide helpful, appropriate signals to
19 the market without releasing information that IOUs consider to be confidential.
20 SCE agrees with Ms. Frayer that aggregated supply and demand tables can provide
21 "accurate and necessary signals on the need for new generation investment."⁵³
22 However, this is not what the CEC staff wants to provide. Instead, the CEC staff
23 singles out one type of LSE, the IOUs, (while excluding all other LSEs), and seeks
24 to force the IOUs to disclose how much each one of them needs to procure to meet

⁵² Id., p. 7.

⁵³ CEC/Frayer, p. 26.

1 its retail customer needs. Release of this confidential market-sensitive information
2 does nothing to provide appropriate signals to market participants on the need for
3 new generation in the state or in the regions served by the IOUs. The information
4 that SCE has no objection to being released (aggregated at the planning area level)
5 provides all of the information that suppliers need to make their investment
6 decisions, and does so without revealing the specific net short positions of the IOUs.
7 As indicated above, California IOUs are primarily procurers of contracts with
8 generators. The fact that a contract ends says nothing about the need for new
9 generation. Contracts can be extended or renegotiated, or the generation
10 underlying the contract can be competitively procured again. Making public one
11 class of LSEs' residual net short provides no information regarding the overall need
12 for new generation. However, the planning area information that SCE has no
13 objection to being released does provide the information that suppliers would
14 need.⁵⁴

15 SCE disagrees strongly with Dr. Jaske's assertion that the "electricity
16 planning process is designed to understand the size of [RNS] and to examine
17 whether there are policy preferences for influencing how it should be filled."⁵⁵
18 Policy preferences, types of resources, and resource durations can all be described
19 and debated without ever revealing RNS. Indeed, these debates and discussions
20 have taken place extensively even over the last two years at the CPUC's Long-term
21 Procurement Proceedings. SCE has been quite vocal about preferences, types, and
22 durations as has virtually every other entity involved in the process. Yet in none of
23 these proceedings has RNS been disclosed.

⁵⁴ SCE disagrees with Dr. Jaske's claim that SCE opposed the aggregation of information being provided on a planning area basis. In fact, his own testimony contradicts this statement. As stated above, SCE sees aggregated supply and demand on a planning area basis to be useful information that the CEC should disclose.

⁵⁵ CEC/Jaske, p. 3.

1 To meet the CPUC's request for information to use in the 2006 procurement
2 proceeding, the CEC can rely on the CPUC's confidentiality protections as it does in
3 Resource Adequacy and other arenas. Alternatively, non-market sensitive energy
4 and percentage mix data can be provided publicly, as SCE has in the past. There is
5 no need to disclose utilities' net short positions to generators in order to meet the
6 CPUC's requirements.

Witness Qualifications

SOUTHERN CALIFORNIA EDISON COMPANY
QUALIFICATIONS AND PREPARED TESTIMONY
OF GARY A. STERN

Q. Please state your name and business address for the record.

A. My name is Gary A. Stern. I am employed by Southern California Edison Company (SCE). My business address is 2244 Walnut Grove Avenue, Rosemead, California 91770.

Q. Briefly describe your present responsibilities at SCE.

A. Since 1998, I have been the Director of Market Monitoring and Analysis in SCE's Regulatory Policy and Affairs Department. I am responsible for monitoring the electricity markets to help assure their efficient operation. I work closely with the ISO on the development of a new market design for California. I am currently working with the California Parties in the refund proceedings at the FERC, and on refund settlements for the 2000-2001 California energy crisis. I am also currently leading SCE's efforts on Resource Adequacy and on the development of capacity markets. I have previously testified before the CPUC and FERC on many occasions, in various proceedings.

Q. Briefly describe your educational and professional background.

A. I received a Bachelor of Arts degree in Mathematics and Economics in 1979 from the University of California at San Diego. I received a Master of Arts degree in Economics in 1981 and a Doctorate in Economics in 1984, both from the University of California at San Diego.

From 1981 to 1984, I worked as an econometrician on the research staff of Quantitative Economic Research, Inc.

I joined SCE in 1984 as a Market Analyst. In 1985, I began working in Generation Planning where I analyzed demand and supply options. I worked on a wide variety of projects as an analyst, supervisor, and manager in System Planning.

1 In 1995, I transferred to the Treasurer's Department where I worked on industry
2 restructuring. In February of 1997, I transferred to Regulatory Policies and Affairs
3 and assumed my present position.

4 Q. What is the purpose of your testimony in this proceeding?

5 A. The purpose of my testimony in this proceeding is to sponsor the portion of The
6 purpose of my testimony is to sponsor the portions of SCE's Rebuttal Testimony, as
7 identified in the Table of Contents thereto.

8 Q. Was this material prepared by you or under your supervision?

9 A. Yes, it was.

10 Q. Insofar as this material is factual in nature, do you believe it to be correct?

11 A. Yes, I do.

12 Q. Insofar as this material is in the nature of opinion or judgment, does it represent
13 your best judgment?

14 A. Yes, it does.

15 Q. Does this conclude your qualifications and prepared testimony?

16 A. Yes, it does.
17

SOUTHERN CALIFORNIA EDISON COMPANY
QUALIFICATIONS AND PREPARED TESTIMONY
OF STUART R. HEMPHILL

Q. Please state your name and business address for the record.

A. My name is Stuart R. Hemphill, and my business address is 2244 Walnut Grove Avenue, Rosemead, California 91770.

Q. Briefly describe your present responsibilities at Southern California Edison Company (SCE).

A. I am the Director of Resource Planning and Strategy for the Southern California Edison Company.

Q. Briefly describe your educational and professional background.

A. I received a Bachelor of Science in Electrical Engineering from California State University, Fullerton, in 1988 and a Master's degree in Business Administration from Cal Poly, Pomona, in 1995.

I began working at SCE in 1986 in the Transmission Planning section of Electric System Planning. I was responsible for studying SCE's transmission system and making recommendations on possible system improvements. I also prepared interconnection studies for Qualifying Facilities (Methods of Service).

In 1988, I began working in the Supply Planning section of Electric System Planning. I was responsible for production cost modeling and project analysis for SCE's long-term resource plans. I prepared economic and operational analyses on SCE projects, such as the Devers-Palo Verde Transmission Line No. 2 project and Balsam Meadow Pumped Storage. I performed resource planning and cost-effectiveness analysis for the Biennial Resource Plan Update (BRPU). I represented Edison in BRPU and California Energy Commission workshops.

From 1990 to 1994, I worked in the Resource Strategies section of Electric System Planning. I performed studies in integrated planning, integrated bidding,

1 and addressed other resource planning issues. Specifically, I was responsible for
2 examining and evaluating supply- and demand-side resource alternatives and the
3 economic and environmental consequences of alternative choices. I also performed
4 economic and operational studies and helped develop SCE's long-term resource
5 plan.

6 From 1994-1996, I worked in the Corporate Development Department of
7 SCEcorp. I developed business plans for new businesses and evaluated large
8 technology investments.

9 From 1996 through September 2000, I worked at Edison International's
10 Strategic Planning and New Business Development group, where I helped evaluate
11 business initiatives for Edison International's companies. These initiatives
12 included: new business startups, acquisitions, performance improvement programs,
13 and alternative operating strategies.

14 From September 2000 through October 2002, I served as Director of Business
15 Development of SCE, where I evaluated a variety of opportunities for the Company.

16 In November 2002, I became Director of Resource Planning and Strategy. In
17 this position, I direct the development of long-term resource plans for SCE. The
18 Resource Planning group evaluates the economics of resource options and works
19 with SCE's business units to balance trade-offs between supply- and demand-side
20 resources. I directed the analysis of demand response, energy efficiency, and
21 advanced metering. I directed the development of SCE's 2003 resource plan, 2004
22 Long-Term Procurement Plan, and the need and cost-effectiveness analysis of
23 Mountainview, San Onofre Steam Generators, Devers Palo Verde 2 transmission
24 line, Devers Palo Verde 1 Series Capacitor Project, and SCE's 2003 Renewables
25 solicitation.

26 Q. What is the purpose of your testimony in this proceeding?

27 A. The purpose of my testimony is to sponsor portions of SCE's Rebuttal Testimony, as

1 identified in the Table of Contents thereto.

2 Q. Was this material prepared by you or under your supervision?

3 A. Yes, it was.

4 Q. Insofar as this material is factual in nature, do you believe it to be correct?

5 A. Yes, I do.

6 Q. Insofar as this material is in the nature of opinion or judgment, does it represent
7 your best judgment?

8 A. Yes, it does.

9 Q. Does this conclude your qualifications and prepared testimony?

10 A. Yes, it does.

**QUALIFICATIONS AND PREPARED TESTIMONY
OF DR. CHARLES R. PLOTT**

Q. Please state your name and business address for the record.

A. My name is Charles R. Plott. I am Edward S. Harkness Professor of Economics and Political Science, California Institute of Technology. My business address is: Division of the Humanities and Social Sciences, California Institute of Technology, 228-77, Pasadena, California 91125.

Q. Briefly describe your educational and professional background.

A. My educational and professional background is described on the attached vita.

Q. What is the purpose of your testimony in this proceeding?

A. I am sponsoring portions of SCE's Rebuttal Testimony, as identified in the Table of Contents, and the Declaration filed on June 17, 2005.

Q. Was this material prepared by you or under your supervision?

A. Yes, it was.

Q. Insofar as this material is factual in nature, do you believe it to be correct?

A. Yes, I do.

Q. Insofar as this material is in the nature of opinion or judgment, does it represent your best judgment?

A. Yes, it does.

Q. Does this conclude your qualifications and prepared testimony?

A. Yes, it does.

VITA
CHARLES R. PLOTT

PERSONAL

Date of Birth:	July 8, 1938; Frederick, Oklahoma
Marital Status:	Married, two children
Address:	Division of the Humanities and Social Sciences, California Institute of Technology, 228-77, Pasadena, California 91125; (626)395-4209; (626)793-8580 (fax) cplott@hss.caltech.edu

EDUCATION

B.S.: Oklahoma State University, Production Management, 1961
M.S.: Oklahoma State University, Economics, 1964
Ph.D.: University of Virginia, Economics, 1965.

PROFESSIONAL APPOINTMENTS

Edward S. Harkness Professor of Economics and Political Science, California Institute of Technology
California Institute of Technology: Professor, 1971-present
Director, Program for the Study of Enterprise and Public Policy, 1979-present
Director, Laboratory for Experimental Economics and Political Science, 1987-present
University of Chicago: Visiting Professor, January 1980-April 1980
University of Southern California Law Center: Visiting Professor of Law, 1976
Purdue University: Assistant Professor of Economics, 1965-67; Associate Professor of Economics, 1968-1970
Stanford University: Visiting Professor, September 1968-September 1969
Economic Theory: Member, Editorial Board, 1994-present
Consortium of Social Science Associations (COSSA): Board of Directors, 1996-1998
National Research Council's Commission on Behavioral and Social Sciences and Education - Board on Behavioral, Cognitive, and Sensory Sciences, member, 1997-2003
Lee Pharmaceuticals: Member, Board of Directors, 1978-1995
Resources for the Future, Summer 1973
Environmental Quality Laboratory (Caltech), Summer 1972.
Chairman, California Institute of Technology Institute Review Board

AWARDS

L'université Pierre Mendès France diplôme Docteur *honoris causa*, 1996
Purdue University Doctor of Letters *honoris causa*, 1995
American Academy of Arts and Sciences, 1985
Econometric Society Fellow, 1985
College of Business Administration Hall of Fame, Oklahoma State University, 1988
Guggenheim Fellow, 1981-1982
Center for Advanced Studies in the Behavioral Sciences Fellow, 1981-1982
Georgescu-Roegen Prize, Southern Economic Association, 1995
National Science Foundation Principal Investigator, 1972-present
Ford Foundation Faculty Research Fellow, 1968
Hooker Distinguished Professor, McMaster University, 1983
Institute for Policy Reform: Senior Research Fellow, 1992-1993.
Journal of Finance Markets Award, 1994
Journal of Financial Markets 2003 Best Paper Award
GSAM Quant Best Paper Prize, *Review of Finance*, 2004

MEMBERSHIPS

American Economic Association; Royal Economic Society; Econometric Society;
American Political Science Association; Public Choice Society, President 1976-1978;
Southern Economic Association, Executive Committee 1977-1978, vice president 1985-1987, president 1989-90; The Mont Pélerin Society; Economic Science Association, president 1987-1988; Western Economic Association International, president 1998/9.

BOOKS

The Allocation of Scarce Resources: Experimental Economics and the Problem of Allocating Airport Slots, with D. M. Grether and R. Mark Isaac. Volume in series *Underground Classics in Economics*, K. Arrow, J. Heckman, P. Pechman, T. Sargent, and R. Solow, editors. Boulder, CO: Westview Press, 1989.

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Information, Finance and General Equilibrium. Collected Papers on the Experimental Foundations of Economics and Political Science, Volume Three. Cheltenham, UK: Edward Elgar Publishing (2001).

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- "Generalized Equilibrium Conditions under Alternative Exchange Institutions." Thomas Jefferson Center for Studies in Political Economy Monograph no. 9. University of Virginia, 1964.
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- "The Probability of a Cyclical Majority," with F. DeMeyer. *Notices: American Mathematical Society* 14 (January 1967):151.
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- "Some Organizational Influences on Urban Renewal Decisions." *American Economic Review* 58 (May 1968):306-321.
- "The Probability of a Cyclical Majority," with F. DeMeyer. *Econometrica* 38 (March 1970):345-354.
- "Rationality and Relevance in Social Choice Theory." Social Science Working Paper no. 5. Pasadena: California Institute of Technology, 1971.
- "Recent Results in the Theory of Voting." In *Frontiers in Quantitative Economics*, edited by M. Intriligator, pp. 109-127. Contributions to Economic Analysis, vol. 71. New York: North Holland, 1971.
- "A Welfare Function Using 'Relative Intensity' of Preference," with Frank DeMeyer. *Quarterly Journal of Economics* 85 (February 1971):179-186.
- "Ethics, Social Choice and the Theory of Economic Policy." *Journal of Mathematical Sociology* 2 (February 1972):181-208.

- "Individual Choice of a Political-Economic Process." In *Probability Models of Collective Decision-Making*, edited by R. Niemi and H. Weisberg. Columbus, Ohio: Merrill, 1972.
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- "On Game Solutions and Revealed Preference Theory." Social Science Working Paper no. 35. Pasadena: California Institute of Technology, 1974.
- "Axiomatic Social Choice Theory: An Overview and Interpretation." *American Journal of Political Science*, XX, 3 (August 1976):511-596. Reprinted in *Social Choice Theory*, vol. I, edited by Charles K. Rowley. Edward Elgar Publishing Ltd., U.K., April 1993:231-316..
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- "The Technology of Public Goods, Externalities and the Exclusion Principle," with R. Meyer. In *Economic Analysis of Environmental Problems*, edited by Edwin S. Mills, pp. 65-94. Columbia University Press, 1975.
- "Transcript of a Five-Member Committee Experiment." Social Science Working Paper no. 110. Pasadena: California Institute of Technology, 1976.
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